THE COMMERCIAL CAR JOURNAL

Entered as second-class matter at the Post Office at Philadelphia, Pa., under the act of March 3, 1879

Vol. XIX PHILADELPHIA, MARCH 15, 1920 No. 1

Published the 15th of each month by the

CHILTON COMPANY

Market and 49th Streets Philadelphia, U.S.A.

JAMES ARTMAN, President C. A. MUSSELMAN, Treas. & Gen'l Mgr.
GEO. H. BUZBY, Vice President A. H. VAUX, Secretary

ADVERTISING DEPARTMENT

C. MONROE SMITH, Eastern Manager
GEORGE H. DUCK, Western Manager
S. S. CHISHOLM, Chicago L. E. McCONNELL, Jr., New York
J. C. WEED, Detroit A. W. BROWNELL, New York
E. W. CORMAN, Cleveland
GEO. D. ROBERTS, Advertising Director, Chilton Service

EDITORIAL DEPARTMENT

JAMES ARTMAN, Editor in Chief E. S. FOLJAMBE, Directing Editor
ALBERT G. METZ, Managing Editor
MARTIN J. KOITZSCH, Associate Editor

EDITORIAL REPRESENTATIVES

C. P. SHATTUCK, Eastern A. V. COMINGS, Western
CHESTER S. RICKER, Technical HARRY R. BRATE, Field Editor

TABLE OF CONTENTS

Advertisers' Index 328
Buyers' Index of Reading and Advertising Pages ... 322
Coming Events 51
Commercial Car Specifications 71
Editorials 57
Equipment and Appliances 83
New Commercial Cars 62
News of the Trade (Including Personals, New Agencies, Factory Items, etc.) 51
Pneumatic Tire Prices 82
Replacement Table 47
Service and Repair Departments 35
Steel and Rubber Markets 100

SPECIAL ARTICLES

How Dealer Overcame Shortcomings of Predecessor 17
The Raids on America's Motor Trade-Marks 20
Trailer Manufacturers Want Laws More Uniform .. 22
Novel Designs of Snow-Removing Appliances 23
Writes Ads. That Convince Farmer Prospects 26
Dealer Tells How to Merchandise Trailers 28
The First British Six-Wheeled Combination 29
The Value of Highway Transport Surveys 30
Opportunity in the Automotive Trade With Russia . 31
Sales Suggestions and Ideas That Make Money 32
Tommy Williams Cuts the Time Factor 33
Any Old Bus Will Not Do for a Service Truck 38
Location of Air Lines in Filling Stations 40
Aftersale Service for Motor Trucks 41
Boston Show 59
St. Louis Motor Bus Service in Transit System 64
Jumping Tests Prove Pneumatics' Advantages 90
Cash in on Sales as Result of Building Boom 94
M. T. C. Specifications for Spark Plugs 98
Comparative Truck and Railroad Freighting Costs .. 104
Keeping Owner Posted on Condition of Trucks ... 108

SUBSCRIPTION RATES

United States and Possessions - - - - - - - - - - - $1.00
Canada - 2.00
Foreign - 3.00

Make Checks, Money Orders, etc., payable to Chilton Company

Change of Address—Subscribers desiring their address changed should give the old as well as the new

The Commercial Car Journal is a member of the Audit Bureau of Circulations, the Recognized Authority on Circulation Audits

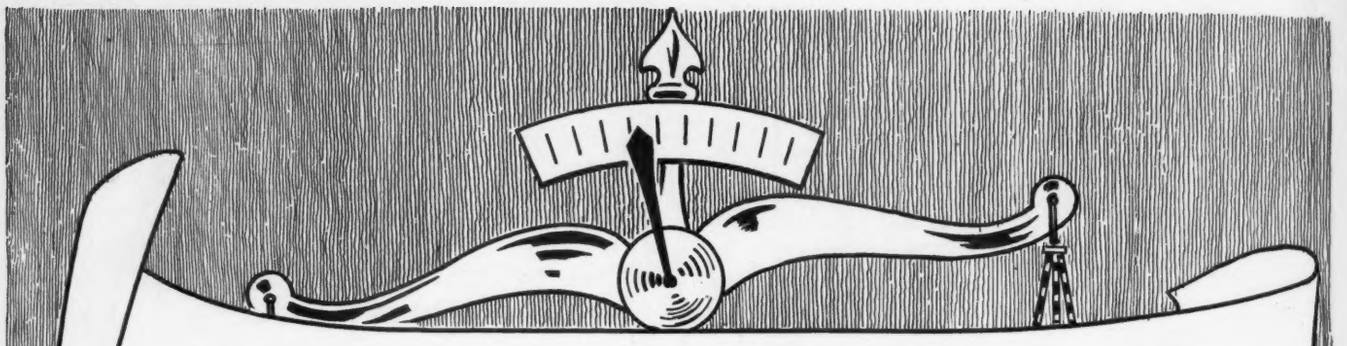
Guaranteed Forgings

We have no desire to make ALL the forgings used in the industry, but for any VITAL part where the forgings call for "more than ordinary" service, we gladly offer our facilities for the solution of your problems.

Wyman-Gordon

"The Crankshaft Makers"

Worcester, Mass.
Cleveland, Ohio



WHICH?

Do you prefer to use iron castings or drop forgings, that add to the total weight of your truck and increase its operating expense or to select

BOSSERT PRESSED STEEL PARTS

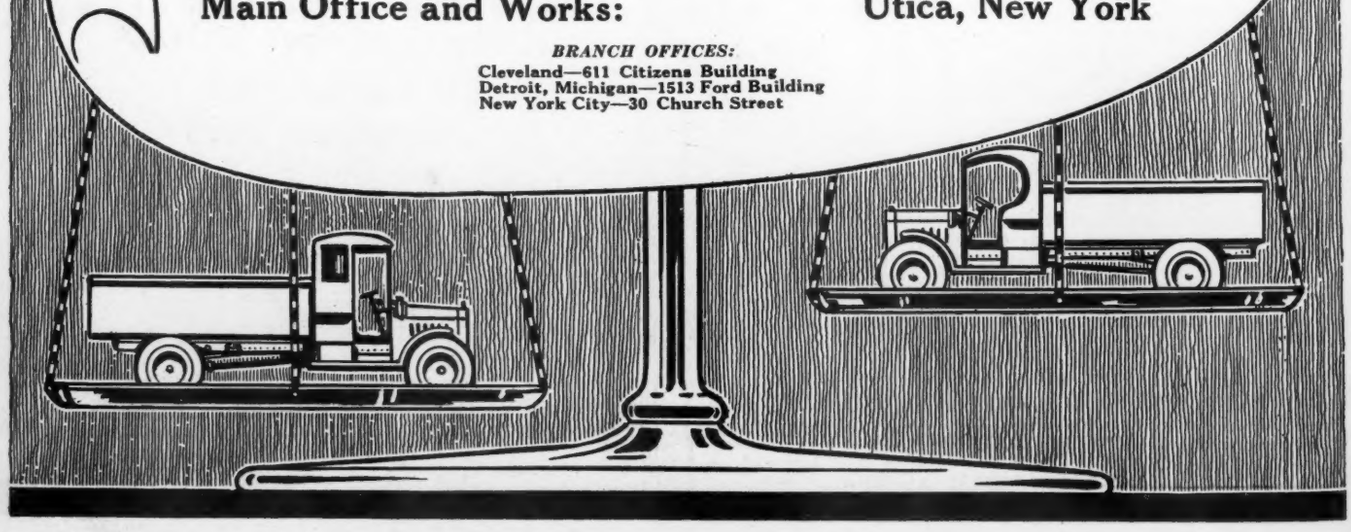
that reduce the weight without sacrificing strength or efficiency? That is the big question that you as a Motor Truck builder or designer must settle to your own satisfaction. The "pounds lighter" truck, constructed from Bossert Pressed Steel Parts, of which there are over 200 in number, consumes less fuel, utilizes less oil and is generally more economical in every way.

"Build the Bossert Way"—Let that be your motive in designing your next model. Use Bossert Pressed Steel Parts for your Transmission Cover, Axle Housing, Gear Covers, Stephangers, Brake Drums, etc.

THE BOSSERT CORPORATION

Main Office and Works: Utica, New York

BRANCH OFFICES:
Cleveland—611 Citizens Building
Detroit, Michigan—1513 Ford Building
New York City—30 Church Street



SPRING PERCH
TRUCK SPRINGS

Notice to the Trade

During the current year we have moved into, and have in full operation, our new, large and thoroughly modernized factory at Stratford, Conn. (Suburb of Bridgeport.)

We manufacture exclusively high-grade leaf springs from thoroughly tested approved alloy steels for both commercial and passenger cars.

We employ the most modern methods and in the hardening and tempering processes, use specially constructed rotary furnaces under thermostatic pyrometer control, insuring, thereby, the finest metallurgic condition possible, with absolute uniformity in temper and hardness.

Believing that the best spring is the cheapest, we invite correspondence and will be glad to submit quotations on receipt of specifications and to assist in the proper design of springs for new models about to be produced.

GET THE BEST

Spring Perch Company

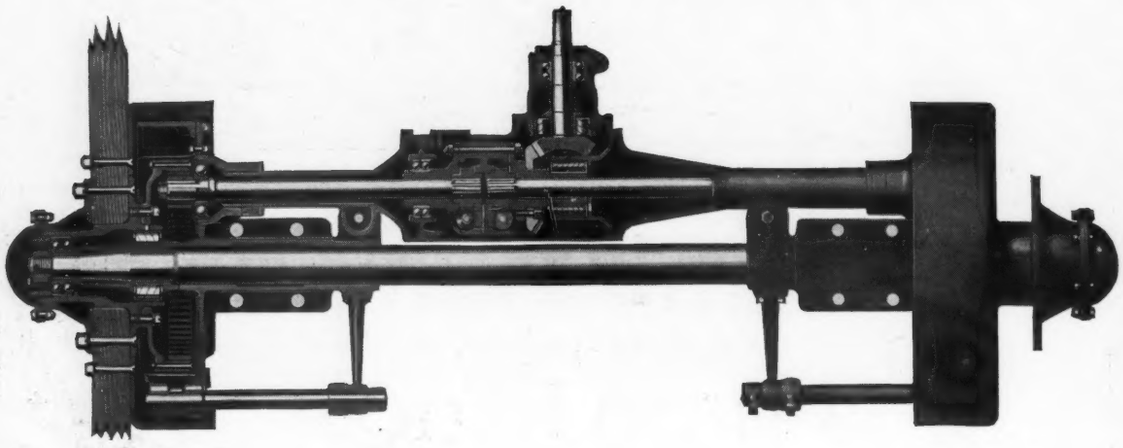
Makers of Springs Since 1843

Stratford, Conn.



KENNEDY AXLES

Make Good Trucks Better



The Axle That Cushions Torque Shocks

KENNEDY AXLES cushion torque shocks by permitting the jack-shaft housing to rotate slightly against the action of four coiled springs. This DECREASES THE STRAIN on all parts of the propelling mechanism; materially INCREASES TIRE MILEAGE; and REDUCES UP-KEEP COST of the truck.

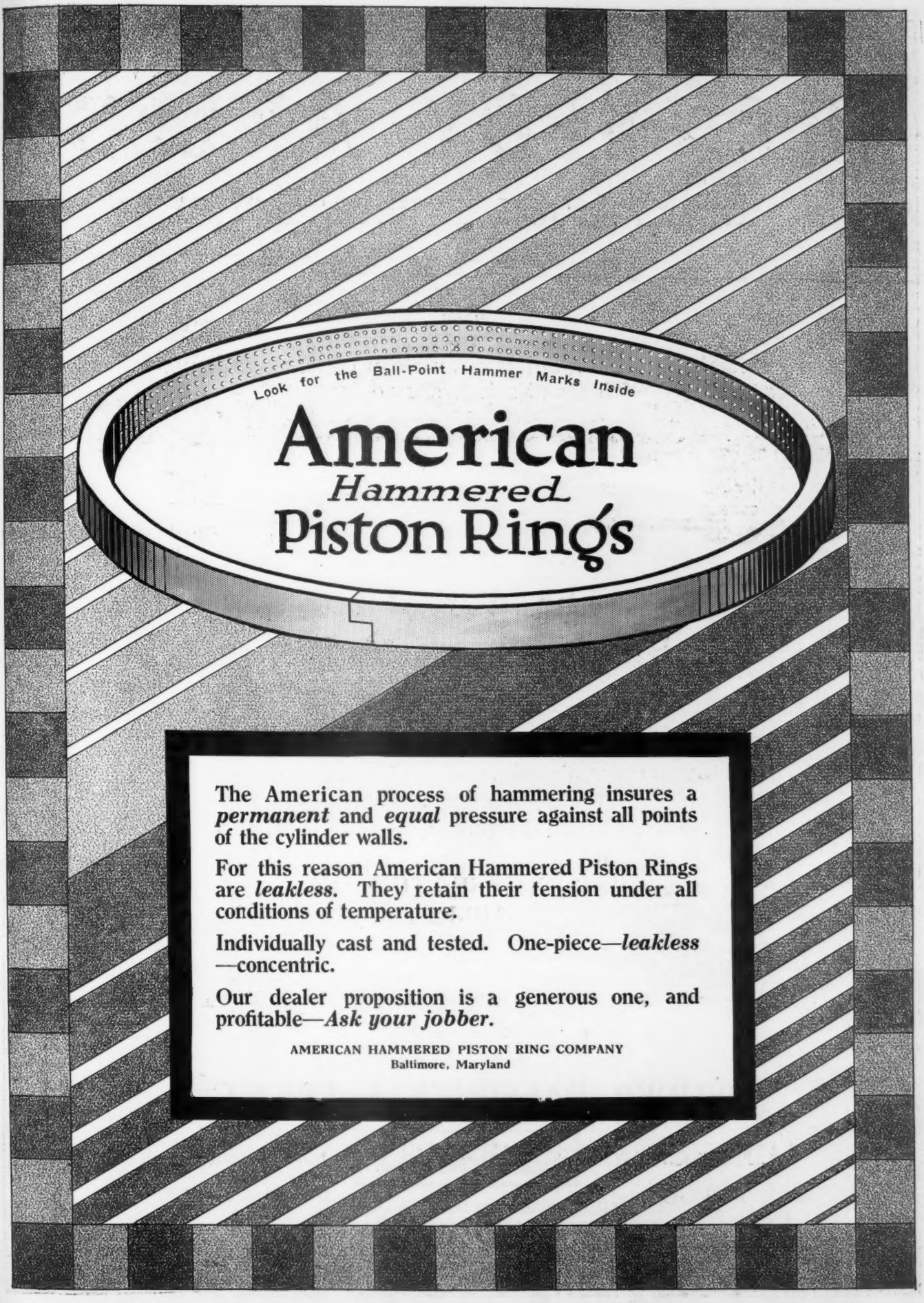
OTHER DESIRABLE FEATURES

1 Ton 1½ Ton 2½ Ton 3½ Ton

Write for Full Information Today

THE HERO MANUFACTURING COMPANY

2302-30 Westmoreland Street Philadelphia, Pa., U. S. A.



The American process of hammering insures a ***permanent*** and ***equal*** pressure against all points of the cylinder walls.

For this reason American Hammered Piston Rings are ***leakless.*** They retain their tension under all conditions of temperature.

Individually cast and tested. One-piece—***leakless*** —concentric.

Our dealer proposition is a generous one, and profitable—***Ask your jobber.***

AMERICAN HAMMERED PISTON RING COMPANY
Baltimore, Maryland

TANK SAFETY

We build ***Safe Tanks*** for motor trucks, motor cars and tractors; Tanks that are not seamed and soldered but of seamless construction, terne-coated after manufacture; Tanks that are specially made to withstand hard usage rather than to succumb to it.

Back of G. P. & F. Tanks is the reputation gained by 39 years of experience in tank making. Our present plant covers over fifteen acres of floor space. Because of its immensity and due to our ample facilities and organization, we can contract to handle your needs, making deliveries at satisfactory dates.

Send us your blueprints with a note as to your needs.





"Our Fifteen Acre Plant"

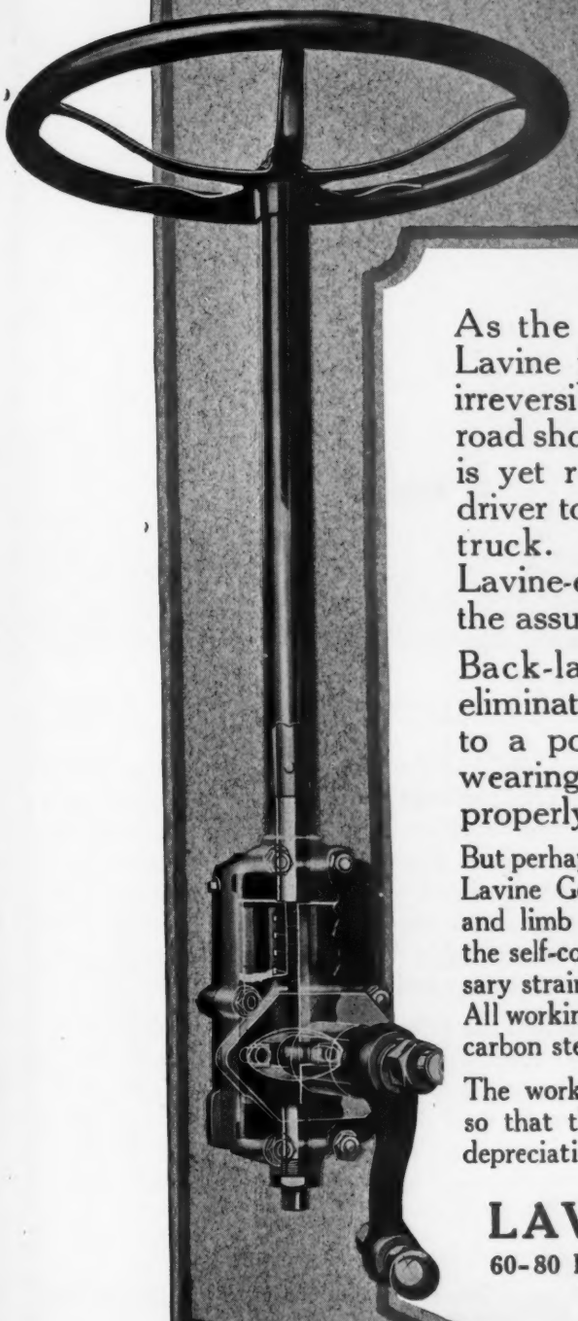
GEUDER, PAESCHKE & FREY CO.

St. Paul Ave., N. W. G.P.&F.SERVICE KNOWING HOW SINCE 81 Milwaukee, Wisconsin

Detroit Office: 1312 Dime Bank Building

LAVINE

STEERING GEARS

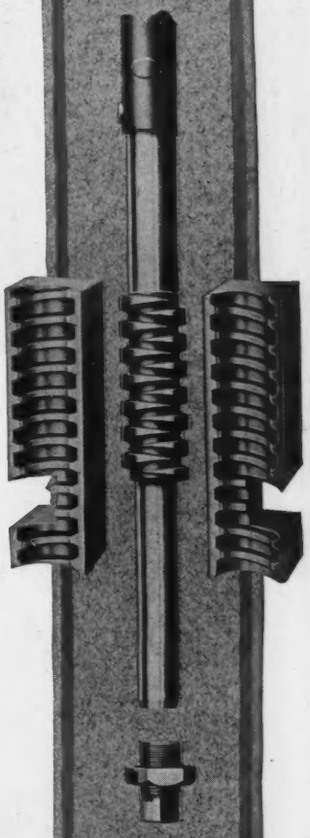


As the ideal steering Gear, the Lavine is constructed so that it is irreversible to a degree where no road shocks are felt at the wheel and is yet reversible enough for the driver to know the next move of his truck. The man who drives a Lavine-equipped motor truck has the assurance of control at all times.

Back-lash has been completely eliminated and lubrication perfected to a point where each and every wearing part is automatically and properly lubricated at all times.

But perhaps the most important feature about Lavine Gears is the factor of safety. As life and limb are dependent on their operation, the self-contained parts that incur no unnecessary strains or thrusts are safe and durable. All working parts are made out of 15 to 25 point carbon steel, heat-treated and drawn in oil.

The working parts are few in Lavine gears so that there is little friction and but slight depreciation.

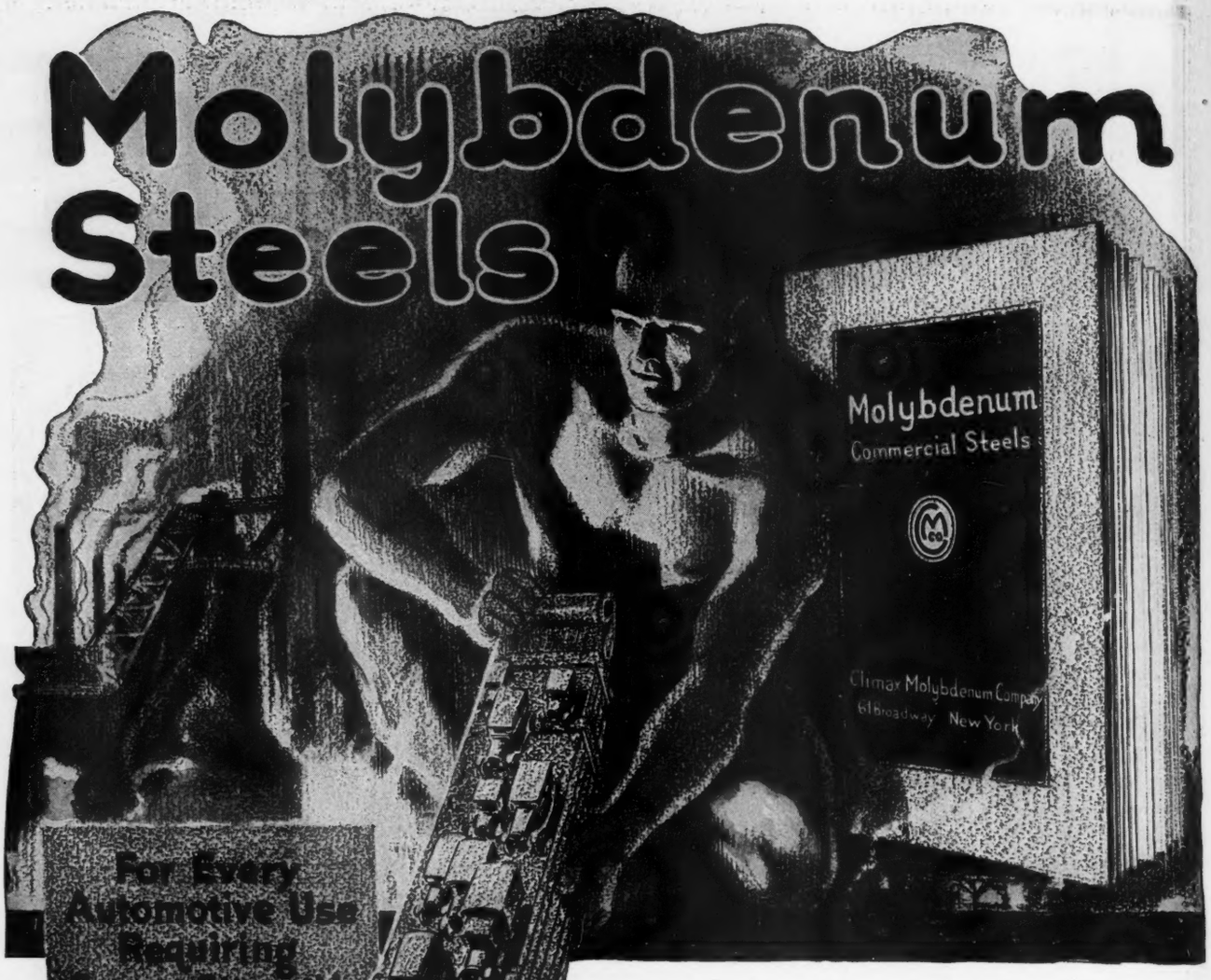


LAVINE GEAR CO.

60-80 Keefe Avenue, Milwaukee, Wis.

FOR TRUCKS & TRACTORS

Molybdenum Steels



For Every Automotive Use Requiring Super Strength

CLIMAX Mo-lyb-den-um The Commercial Alloy

Easier to Heat Treat
Easier to Machine
Dynamically Tougher
Resist Fatigue

The Commercial Alloy Steel

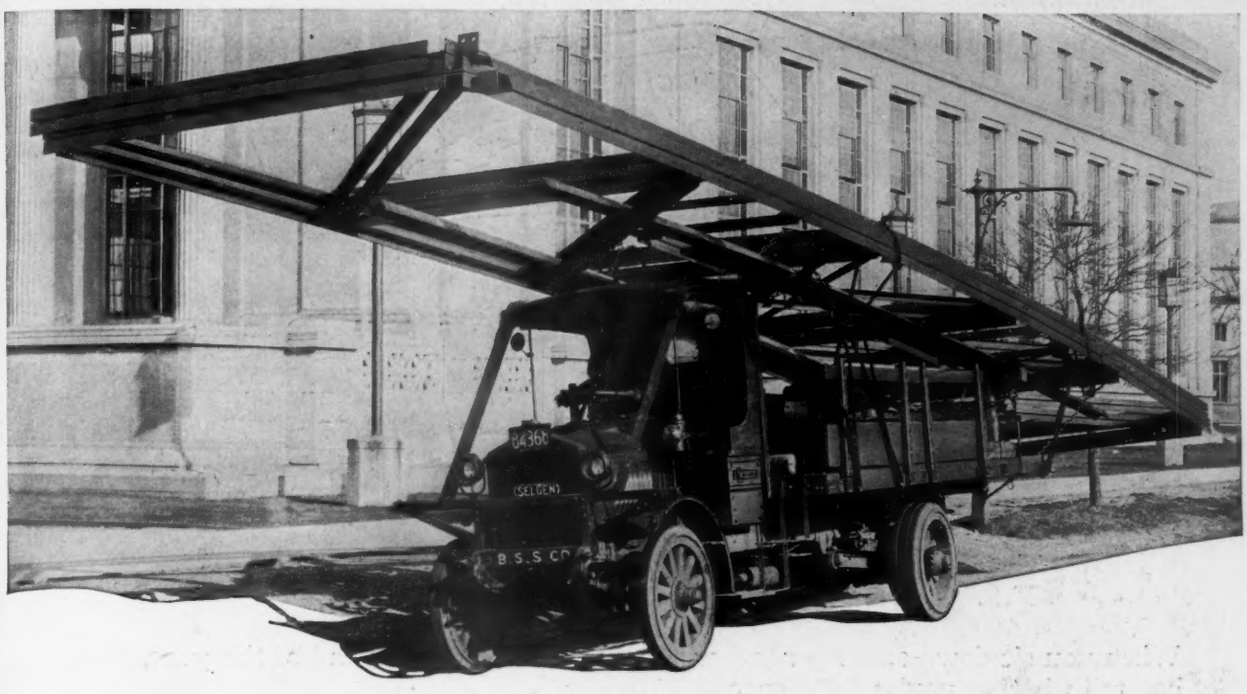
DYNAMICALLY tougher, yet easier to machine for given strength—capable of withstanding a wider temperature range in heat treatment without detriment to their physical properties—Molybdenum Steels bring to the industry a new combination of utility, manufacturing facility and economy. In short, they provide better materials, easily produced—at a commercial cost.

These facts are fully demonstrated in our book—"Molybdenum Commercial Steels." This volume, the first in its field, scrupulously avoids conjecture and draws its data directly from commercial practice covering many thousands of tons of Molybdenum Steels used in the past two years. It invites investigation.

Copies will be mailed upon application to

Climax Molybdenum Company—or—The American Metal Company Ltd.
61 Broadway ——— New York
Climax Molybdenum Company is the Largest Producer of Molybdenum in the World

PROVEN IN WAR FOR THE TASKS OF PEACE



Advantages of the HIGH QUALITY of Selden Trucks

DEALERS who handle Selden Trucks are building worth while reputations for their organizations. And they are making a margin of profit that stays with them—that is not swallowed up by "free service."

Selden "In-built Quality" provides Selden Trucks with the strength to work on indefinitely at low cost—to carry their own loads without constant calls upon the dealers for service that eats up profits on sales.

Selden Dealers know that one Selden Truck in service means more later—that their sales of Selden Trucks are limited only by the user's need for trucks—that repeat orders on Selden Trucks invariably follow initial sales. And back of every Selden Truck stands the reputation of the Selden factory for square dealing with its dealers and their customers.

Ask Selden Dealers about the sales organizations they are building with Selden factory co-operation.

To aggressive, farsighted dealers we still have some territory to offer, though not a great deal. Write us if you would like to become a Selden Dealer.

The Magazine "TRUCK TRANSPORTATION" will be sent free to all interested. Write Dept.CO

SELDEN TRUCK CORPORATION
Rochester, N. Y.

Ship by Truck—SELDEN Truck

1½, 2½, 3½, 5 Ton Worm Drive Models

Selden Motor Trucks

SELDEN TRUCK CORPORATION, Rochester, N.Y., U. S. A.



Profits of Automotive Dealers Greater Each Year!

When you sit down and figure up what you've made at the end of the year, you can tell whether you've been successful or not.

Each year the trial balances of Automotive Trailer Dealers reveal greater *and greater profits.* Need more be said?

The reason for this success is found in the product. Trailers *are* in demand—Automotive Trailers are particularly so! They exactly meet the needs of thousands of prospects in every locality.

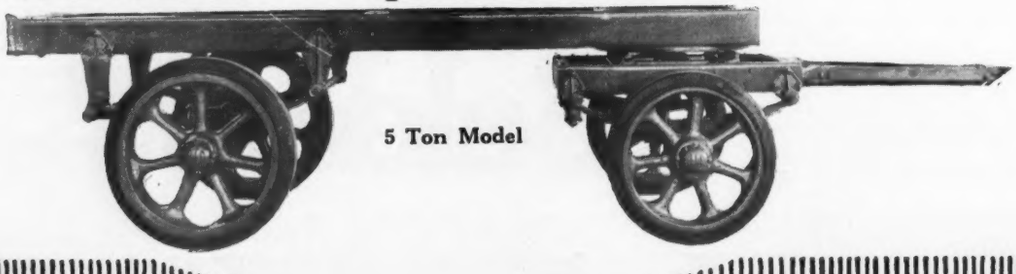
Many of our most successful dealers are Motor Truck Dealers who combine a truck and this trailer line very profitably. As a truck can haul many times the load it can carry, Automotive Trailers can logically be sold by any progressive truck dealer who wishes to increase his earnings.

They have a roller-bearing turntable, steel wheels, oilless bushings, and standardized construction. Complete line includes 4-wheel, semi-pole and 2-wheel trailers, varying from 1 to 15 tons in capacity.

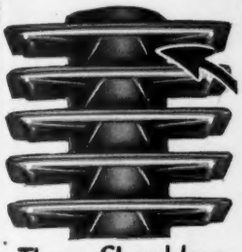
AUTOMOTIVE TRAILER CORPORATION

General Offices:
1442 McCormick Building, CHICAGO, ILL.
Factory: ***KINCAID, ILL.***

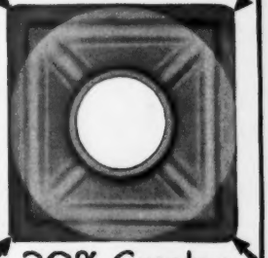
THE FREIGHT CAR OF THE HIGHWAY



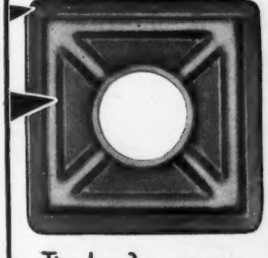
5 Ton Model



These Shoulders give more efficient contact between fin and tube



20% Greater Cooling surface with the same spacing found in other tubular types



The large square fin furnishes maximum area in contact with the air

G&O Radiators

SQUARE FIN TUBULAR CORE

Establishes a Higher Standard in Heavy Duty Engine Cooling



The advantages of the G & O Square Fin Tubular Core are so pronounced that automotive engineers and manufacturers regard this exclusive G&O feature as an essential wherever heavy duty service is required and maximum cooling efficiency demanded.

The G & O Manufacturing Co., New Haven, Conn.

Foreign Representatives: The Robertson-Cole Company
Branches: Detroit, Philadelphia



Autocars solve problem for big New England grocery house

S. S. Pierce Company, Importers and Grocers, of Boston, are steadily increasing their fleet of Autocar Motor Trucks to care for the spreading out of their delivery territory because of the movement of population into the suburbs.

They bought their first Autocar seven years ago. Today they own forty-five.

The business of the S. S. Pierce Company has greatly increased during the past year, showing, among other things, that the public appreciates reliable delivery service.

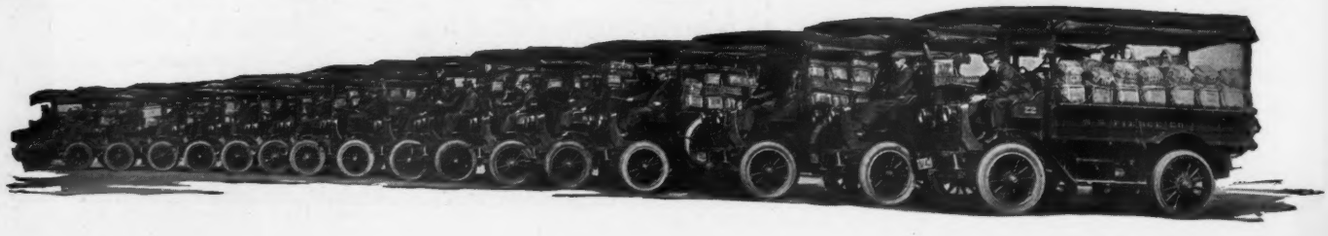
Chassis (1½-2 ton)
$2300 97-inch wheelbase
$2400 120-inch wheelbase

THE AUTOCAR COMPANY, *Ardmore, Pa.* Established 1897
The Autocar Sales and Service Company

Boston	New York	Philadelphia	Chicago	Pittsburgh	San Francisco
Providence	Brooklyn	Allentown	St. Louis	Los Angeles	San Diego
Worcester	Bronx	Wilmington	Baltimore	Stockton	Sacramento
Springfield	Newark	Atlantic City	Washington	Oakland	Fresno
New Haven					San Jose

Represented by these Factory Branches, with Dealers in other cities

Autocar



The Commercial Car Journal

VOLUME XIX PHILADELPHIA, MARCH 15, 1920 NUMBER 1

How One Dealer Overcame the Shortcomings of His Predecessor

New York Truck Dealer Inaugurates a System in His Territory That Effectively Solves Service Problems and Stimulates Farm Sales

By C. P. SHATTUCK



Show and Salesroom of H. F. Doughty, Rochester, New York.

Orderly Arrangement of Windows is a Big Drawing Card.

WHAT would you do, Mr. Dealer, if you were offered a territory in which a number of trucks had been sold by previous representatives and where it is alleged that through lack of proper merchandising and service the owners of the trucks were not satisfied?

Would you pass it up or would you roll up your sleeves and tackle the proposition?

Such a situation confronted H. F. Doughty when he returned from overseas. Like hosts of others in the automotive industry he gave up selling trucks, left a good business, to aid in licking the Hun.

Having been for years connected with the truck industry in its various branches, from the mechanical to the selling end, he sought an opportunity as a dealer or distributor in a large territory, preferably where there were opportunities for merchandising trucks in farming sections and what is termed isolated territory. Opportunity was presented in Rochester, N. Y., and the territory included Monroe County, in which Rochester is located, and eight other counties in New York and one in Pennsylvania.

Made Thorough Investigation

Mr. Doughty conducted a very thorough investigation before closing. In Rochester, where he proposed to make his headquarters, he found the owners dissatisfied because of previous negligence. Attention was then directed to the balance of the territory and Mr. Doughty drove over it in a car. He talked with owners of the truck, with dealers, garagemen, farmers and business men. Among other things he discovered that the owners were not prejudiced against the truck but the service policies. A few instances were noted where the improper size of chassis had been sold and wrong type of body used. A careful analysis of the territory revealed excellent possibilities and despite existing conditions Mr. Doughty decided to stick.



Two Boards Mounted on Easels Are Used for a Window Display and Photographs Showing Trucks Sold and in Various Industries Are Tacked to the Board.

Carefully Picks Wholesale Man

In building up his sales organization and formulating his service policies, Mr. Doughty decided to be the executive, not a salesman. After considerable investigation he engaged what he terms his wholesale man. This was not easy because it was essential that the candidate have the qualifications of a sales manager, service head, credit man, advertising manager, transportation engineer, and the ability to analyze the requirements of the small dealer. In speaking of the wholesale man Mr. Doughty said that he had experienced much difficulty in securing one with the essential qualifications, and that many applicants were investigated before one was selected.

Having obtained his man Mr. Doughty outlined his policies and turned over the data he had accumulated during his investigation of the territory. It is up to

the wholesale man to close the territory, to appoint dealers. He has the say of who is the most logical representative and his judgment is accepted by Mr. Doughty. When the roads can be traveled with a car the wholesale man covers the territory with a machine. The salesmen of the company also utilize passenger cars, it having been proven by Mr. Doughty that not only can they cover considerably more territory in less time than by the conventional common carriers but the automobile is a factor in sales in that a prospect can be transported to the salesroom and service station. The advantage of this plan will be referred to later in connection with the service policies.

Mr. Doughty's experience, and he has been selling trucks ever since they were introduced, has taught him that the distributor's responsibility does not cease with the signing of the contract.

There are two types of dealers appointed. One is in closed territory where the representative is awarded a well defined territory and signs a contract. The number of trucks these dealers are required to carry is based on actual conditions existing in the territory. The number of townships, population, roads, etc., are carefully considered and no attempt is made to load a dealer with more trucks than he can sell.

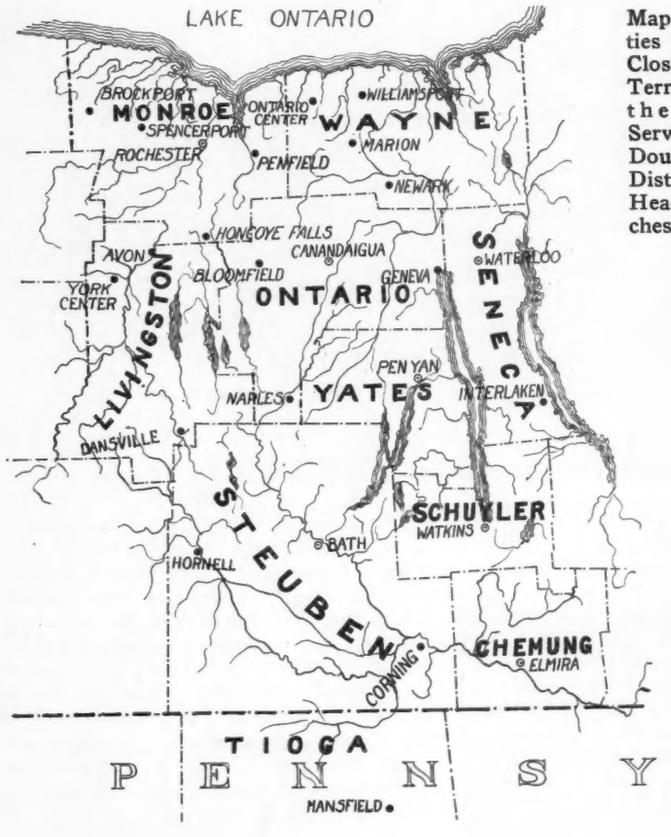
The other class of representative is the open territory dealer who is not given any well defined territory although he is not allowed to invade the territory of the closed type of dealer should the sections adjoin one another. The open territory dealer is not obliged to buy a truck at first. He is consigned a truck, one most adaptable to his territory, but the consignment contract reads that the truck must remain in the building and cannot be demonstrated. It is for display or exhibition purposes only. It can be sold, however. After this type of dealer has sold a truck or two effort is made by the wholesale man to interest him in becoming a closed territory dealer. This is done only if the representative is a good prospect for closed territory, and after thorough investigation by the wholesale man of all factors entering into the representation.

Mr. Doughty in discussing the types of dealers for the open or isolated territory said that he has found that the live wire, progressive garages or repair shops and passenger car dealer can be educated to sell trucks and make successful dealers. He bases his arguments on the fact that the garageman's and repairman's all around mechanical knowledge gained through handling many different types of passenger cars and trucks admirably adapts them to give the best service on trucks. For this reason Mr. Doughty's policy included the appointment of this type and he says that thus far it has worked out most satisfactorily. Furthermore, Mr. Doughty stated that these men have an intimate acquaintance with owners of trucks in their territory and that when they advise an owner his truck needs certain work the owner invariably heeds the advice.

Both the closed and open territory dealer is obliged to service the old and new trucks in his territory, and every one must post in a conspicuous place a service sign. Truck owners are informed of these service stations and advised to call for service when needed. Service letters, bulletins, follow-ups, etc., are mailed direct. In other words, effort is made to check the service both through the owners and the wholesale man. All complaints are adjusted by the wholesale man on his frequent investigational trips through the territory.

The closed type of dealer must carry a certain amount of spare parts, the number being based on the old trucks, the new and chassis stocked. Lists of spares, number of quick moving parts as well as those stocked for emergency, are prepared at the home office for the convenience of the dealer.

The open territory representative is not compelled to stock parts although effort is made to interest him, when his finances will permit. These dealers are instructed, educated and encouraged, to call the Rochester office on the phone when a part is needed and the order is promptly filled and immediately carried to the express office. Notice of shipment is given to the dealer.



Map Showing Counties and Location of Closed and Open Territory Dealers in the Ten Counties Served by H. F. Doughty, Republic Distributor With Headquarters at Rochester, N. Y.

FORM 115

INSPECTION REPORT Date_____ 19____

Name_____

Address_____

Phone No._____

Make of Car	Date last Inspection 19
Model	Speedometer Reading
	Total Mileage
Car No.	Mileage last Inspection
	Net Mileage Run in
License No.	Months Days

Items marked "A" required attention and were attended to. Items marked "S" will require Shop attention.

See that Car is thoroughly Greased and Oiled. Owner is to pay for all Oils, Grease and Materials.

MOTOR		Spark plugs		REAR AXLE	
Is motor tight in frame?		Wiring		Bearings	
Compression		STEERING GEAR		Are wheels in line?	
Do valves need grinding?		" " Connections		Condition of brakes	
Carbon		Is it being properly oiled?		SPRINGS	
Are timing gears noisy?		Is there too much lost motion?		Are clips tight?	
Piston Rings		SERVICE BRAKE		Do leaves need oiling?	
Connecting rod bearings		HAND BRAKE		GREASE CUPS	
Main bearings		FRONT AXLE		Are all cups filled?	
Push rods		How are wheel bearings		GENERATOR	
Is motor kept clean?		Are wheels in line?		Does it show proper charge?	
OILING SYSTEM		Is axle in line?		Chain tension	
Oil level		CLUTCH		STARTING MOTOR	
Pressure		Does it grab?		Condition	
Circulation		Does it slip?		BATTERY	
COOLING SYSTEM		Are the rollers greased?		Was it properly filled?	
Radiator		Is thrust bearing oiled?		Gravity test	
Pump		Propeller shaft bearing		TIRES	
Are connections tight?		Universal joints		Pressure	
Is fan being lubricated?		Are universal joints greased?		Front R L	
Is fan properly adjusted?		TRANSMISSION		Rear R L	
CARBURETOR ADJUSTMENT		Condition of gears		LIGHTS	
Carburetor leak		Condition of bearings		Front	
Gasoline line		Condition of grease		Side	
IGNITION SYSTEM		DIFFERENTIAL		Rear	
Timer		Condition of gears			
Coil		Condition of grease			

Time Required_____ Hrs.

_____ Quarts Cylinder Oil

_____ Pounds Cup Grease

_____ Pounds Trans. Grease

Mechanic

O. K._____ Foreman

If there are any additional notations or recommendations write them on the reverse side, and put an "X" here._____

Inspection Form or Report Which Each Dealer Fills Out.

How Hurry Calls for Parts Are Handled

The problem of reducing the idle time of the truck requiring service, where the owner cannot afford to wait for the express shipment to arrive, is partly solved by the dealer being instructed to send a man to Rochester for the part or parts. The dealer is educated by the wholesale man to advise the owner that while it will

involve an extra cost to send a man for the parts, it will be done if the owner is badly in need of the services of the truck. It is pointed out that the open type dealer is located in mostly farming sections, and that if he observes the inspection and repair policies, the need of sending a man to Rochester will be seldom. The open territory dealer can, of course, obtain a part from the closed type of dealer if the latter be within a reasonable distance.

Although Mr. Doughty in discussing the service angle does not consider the plan as being ideal, he believes that it is the most practical system under existing conditions. He further stated that if his wholesale man uses good judgment in the selection of the open territory men a certain per cent. would eventually develop into the closed type of dealer.

The closed and open territory dealer is not left to his own resources after his appointment, particularly the latter. There is close co-operation between all heads of the departments of the home office and the dealers. The wholesale man virtually lives with the dealers, aiding them in analyzing their territory, educating them in sales methods, advertising and service. He also aids in closing difficult prospects and assists in laying out the order and style of the literature and follow-up letters contemplated by the dealer. The dealers are educated in body requirements, to qualify them to suggest the type of body that will best meet the requirements of the owner. Out of town prospects, calling at Rochester, are shown the truck, etc., and the name of prospect is then turned over to out of town dealer.

Every representative sends a list of his prospects to the Rochester office. When a sale is made this is reported and the name is transferred from the prospect to the owner list for the service department and for the wholesale man. As soon as a name is transferred the wheels of the service organization are set in motion.

Well Defined Service Policy

Mr. Doughty has evolved a well defined service policy and incidentally his interpretation of the word service does not mean something for nothing; in fact, on the bulletin board in the salesroom is a brief and pertinent notice to the salesmen to this effect. It reads, "Do Not Promise Something for Nothing When Discussing Service." The closed territory dealer must maintain a good repair shop, employ capable mechanics and stock parts. If necessary, dealers can obtain the benefits of the knowledge of expert mechanics, men familiar with the truck sold by the company. Effort is made to develop high grade work.

Dealers must keep in contact with the owners of trucks in their territory and must educate them to bring in the truck at least once every 30 days for inspection,



H. F. Doughty
Distributes Republic Trucks in Ten Counties in New York and Evolved Commendable Dealer and Service Policies

etc. A written report is made out and sent to the home office showing the condition of the truck, suggestions made for work and the attitude of the owner. A form is provided for the inspection and a record kept of the forms. Dealers are also expected to advise their customers of the precautions necessary when operating their trucks in the winter. This affords the dealer an opportunity to merchandise winter equipment and supplies.

It is obvious that the open territory as well as closed type of dealer takes advantage of his opportunities and it brings up the interesting thought that manufacturers and distributors of equipment and supplies for trucks may discover that these types of truck dealers may afford a market that is well worth developing. After considerable research work among the isolated type of truck dealer in several states the writer has come to the conclusion that the truck dealer in the small places has been neglected by the manufacturer and jobber, at least no well defined effort has been made to exploit this fertile field.

Reference is not made to staple supplies such as spark plugs, brake lining, etc., but to the numerous devices making for comfort and convenience of the driver, traction devices, heaters, signals, rear view mirrors, anti-freezing solutions, radiator guards and covers, and many others which afford the dealer an opportunity to make a good profit on a small investment.

The time is not far distant when the distributor working along the same lines as Mr. Doughty will supervise the dealer's selection of truck equipment and supplies ,and conduct an educational campaign among them to demonstrate the sales possibilities. And there is no reason why the progressive distributor should not act as middleman. The open type and many of the closed type of dealers are well situated to merchandise this material for they have the advantage of personal contact with the truck user and none of the disadvantages of the big city truck dealer who has competition, in the large and popular priced supply houses.

Who is Best Qualified to Sell the Farmers?

The counties in which Mr. Doughty is exploiting trucks are largely agricultural; fruits, grain, vegetables, dairy, etc., and because of this and his experience in selling trucks among the farmers on Long Island, N. Y., he is well qualified to express his opinion as to the best type of salesmen to sell the farmer. Mr. Doughty said that the dealers he has appointed are the most successful and are far superior to the city trained truck salesman. "In the first place," said Mr. Doughty, "the dealers I have appointed were born and brought up in the territory. They know every farmer worth while knowing, the conditions existing on his farm, how he ships his products, and last but not least has a line on his financial condition for you know in the small places the man with bad credit is well advertised. Many of the farmers own passenger cars and have their repairs done at the dealer or garage or repairman's place. This not only affords our representative a chance to talk and show trucks, but—best of all—the repairman has the confidence of the farmer. Such a dealer generally knows all members of the farmer's family, so it is easy for him to approach his prospect and to interest him.

"The city salesman, no matter how clever he is, is handicapped by not being acquainted with the farmer, his conditions and his temperament. Of course, the city truck salesman has and will sell the farmer but I have found that when you can 'visit' the farmer and talk his talk, it goes a long way in securing his confidence,

Form 61—STOCK ROOM RECORD CARD

DESCRIPTION OF PART | MINIMUM | MAXIMUM | PARTS NO. | COST | SELL | SEC. | BIN NO.

FOR _____ CAR MODEL _____ NUMBER USED IN COMPLETE CAR _____

ON ORDER				RECEIVED				DELIVERED					DELIVERED				
Date	Order No.	Routing	Qty.	Date	Invoice No.	Qty.	Total Received	Date	Req. No.	Qty.	Total Del'd	Balance O. H.	Date	Req. No.	Qty.	Total Del'd	Balance O. H.

The Requisition on Stockroom Used at Service Station.

and if you can't sell him confidence you are wasting your time and the firm's money. And another angle is that the type of country dealer I have mentioned can be more direct in his talks than the city dealer or salesman. Having a personal acquaintance the country dealer can emphatically lay down the law to his customers when it comes to care, maintenance and repair of the trucks, and the farmer will listen," and Mr. Doughty quoted several instances that came under his observation while traveling his territory. One of the problems in selling the farmer trucks is educating him as to the proper type of body to use. Mr. Doughty said he found many owners bought a body not adapted to their requirements and that upon investigation discovered that the farmer bought the body because a neighbor had a similar design on his truck. "I believe we truck dealers cannot be too careful in the matter of body recommendations to the farmer," said Mr. Doughty. "One type of standard body may not be adapted to another customer's requirements. What we should do is to carefully analyze the products the farmer transports and endeavor to sell him a body that can be universally used taking into consideration economical haulage as a whole."

One and a Half Ton Most Popular

The 1½-ton capacity chassis has proven the most popular type in the territory, although many 1500-lb. and 2½-ton trucks are used. The big pneumatics are growing steadily in favor and Mr. Doughty suggests use of these to the prospect.

A large stock of parts is carried at the Rochester store and dealers draw from here. Salesmen are encouraged to bring their local prospects and those in the surrounding territory to the salesroom when practical, to demonstrate that the company does carry a large stock of parts and that the service station can give service. This is done to prove to the customer that parts are really carried in stock, and not on paper, as Mr. Doughty expresses it.

Used trucks are taken as part payment but the appraisal is made sufficiently low to amply cover the cost of overhauling the trade-in. Consideration is also given in the estimate to cover interest on investment, overhead, advertising, selling, etc. Mr. Doughty says the "shopper" gets short shrift from him, that he allows the "cut price dealer" in the form of a trade-in to accumulate a stock of old trucks. A cast iron rule is that any appraisal made is void after a week. These are the policies outlined to the writer by Mr. Doughty who is located at 204 Court St., Rochester, N. Y., and who distributes Republic trucks.

Raids on America's Motor Trade-Marks

By WALDON FAWCETT

THE latest news from Oporto, Portugal, is to the effect that Manuel da Silva Carmo, champion pirate of American motor marks, is willing to "settle" with his victims in the trade, for what is characterized as, in each instance, a "nominal" sum. Negotiations have not yet progressed to the point where it has been revealed what compensation will induce Carmo to relinquish his claims but the impression has been conveyed that the consideration in each instance will be little if any more than is represented by the expense to which the Portugese pirate has been put in acquiring the marks,—say, an average of perhaps $60 for each country in which enrollment has been secured for a misappropriated trade-mark.

American specialists in trade-mark practice and the attorneys and counsellors of manufacturers in the American automotive industries are at a loss to explain the reported sudden change of heart on the part of the Portugese who had, at one swoop acquired title to the foreign rights in half a hundred of the best known trade names in the American automobile and truck industry. They can only surmise that the nerve of this ultra-modern bandit has been somewhat shaken by the energetic steps taken by the U. S. State Department at the instigation of the National Automobile Chamber of Commerce in an effort to undo the harm.

Whatever the explanation of the backdown of the trade-mark poacher, the firms in the trade are being strongly urged to settle with Carmo if he is willing to relinquish his holdings on moderate terms. Trade-mark attorneys have told the tradesmen whose commercial names are in jeopardy that it will be much cheaper to compromise with Carmo, if it be practicable as reported, than to undertake to fight the thing out in the Portuguese courts, albeit the automotive interests are now represented on the scene by an efficient attorney whose services were enlisted through the good offices of U. S. consular officers acting unofficially. In any event, a compromise with a trade-mark buccaneer who is penitent enough to settle on the basis of his actual expense account is infinitely to be preferred to the experience of a number of Yankee builders of trucks and automobiles who have had to pay ransom in sums up to $25,000 in order to land their vehicles at the ports of entry of Latin-American countries where their trade-marks had been pre-empted.

Just a Case of Wholesale Craft

Irritating as has been the current wholesale raid which has sought to "sew up" the rights in American automotive trade names via blanket registrations under that league-of-nations compact known as the Berne Trade-Mark Convention, it has, from a trade standpoint, certain compensations. For one thing, this latest raid has been so daring in execution and so sweeping in scope that it has aroused the whole body of exporting tradesmen to the menace which lies in an international system that permits the establishment of property rights in any trade name by the individual who happens to first lay claim to it or register it, regardless of whether or not he happens to be the originator or rightful owner of the name. This "quantity production" in trade-mark brigandage has also shown American automotive men that they are all in the same boat when it comes to danger of the barefaced theft of their trade names. This will at least serve to disillusion those tradesmen who, in the light of certain incidents in Cuba and South America, supposed that it was merely the producers of expensive American passenger motors that were to be the prey of the trade-mark pirates.

A second source of satisfaction that the trade optimist may find in the current predicament, maddening as it is, consists in the fact that in this Carmo case, which bids fair to supply in its outcome an impressive precedent, the issue has been squarely joined on an out-and-out proposition of piracy for immediate cash returns. That is to say, here we have a case where automotive business badges were brazenly borrowed to be held for redemption as compared with a case where an American automotive trade-mark has been registered by a foreigner incident to the exercise of sales agency rights in connection with the product whose name has thus been authenticated.

Trade-Mark Registered Under Agent's Name Should be Discouraged

It may as well be confessed just here that the beclouding of the straight piracy issue with the misunderstanding arising out of trade-mark custody by exclusive agents abroad has operated to withhold from American automotive interests some measure of official remedial aid. For several years past the U. S. Bureau of Foreign and Domestic Commerce has made it a point to give prompt notification by telegraph or mail to the owner of any trade-mark or trade name in the American automotive industry whose name or insignia was found "posted" in any foreign governmental gazette for registration to any interest other than the American originator of the design. Similarly, everything possible has been done both by the Department of State and the Department of Commerce to undo the harm of trade-mark piracy when actually accomplished. However, the Federal officials have sometimes found that they had their labor for their pains in that some of the foreign registrations of American motor marks, though made in the names of foreign citizens, were with the consent of or at least without opposition from the American principals, the registrants being the authorized sales agents for the lines whose trade names were thus pre-empted.

The circumstance that some of the past efforts for recovery of trade-mark possession have been aimed not at professional pirates but at sales agencies with which the complainants had long enjoyed amicable relations has made the officials in some countries the more prone to take none too seriously the protests of Americans whose trade-marks have been filched. It has been easy under such circumstances for the foreign official (naturally sympathetic, on general principles, with the cause of his countryman) to excuse inaction on the plea that the whole incident appears to be merely the result of a misunderstanding between erstwhile business associates. In some instances, sure enough, the foreign agent feels as much aggrieved as the American manufacturer whose trade-mark the representative has regarded as his very own in his own sales territory. However sales agents in such strategic position have seldom scrupled to use their trade-mark registrations as clubs to compel a continuance of exclusive agency relations and in some instances to force the concession of an extra commission on sales.

All the intensive study that has, this past two months, been given to the subject of the protection of internationally known motor marks as a result of the foray by Carmo, has failed to disclose any effective means of ending or forestalling trade-mark piracy except by the long-recommended but as long-ignored expedient of registering each motor mark in every country to which automotive products are exported or are likely to be exported at any time in the future. Automotive firms have canvassed the situation pretty carefully this past few weeks and have been forced to the conclusion that there is no short-cut to immunity or protection from trade-mark piracy. Even if the Carmo incident is closed with the payment of as little ransom money as could be hoped to suffice, it will merely go to show that, at best, a disproportionate expenditure of time and money is necessary to undo harm that might have been forestalled by the proverbial ounce of prevention.

Manufacturers to be Responsible

It is because of this demonstration that there is no get-rich-quick route to safeguarded trade-mark assets that the National Automobile Chamber of Commerce will, with the meeting of the board of directors in March, enter upon a project whereby the national organization instead of the individual manufacturer will be responsible for invoking the best preventatives of trade-mark piracy. No reader of this journal need be reminded, perhaps, with what persistence the members of the National Automobile Chamber of Commerce have been urged to register their trade-marks or trade names in foreign countries. As recently as January, 1920, Robert A. Branningan, Manager of the Patent Department, estimating the cost of international trade-mark protection as $7 per year per country, called attention to the fact that the sale of a single car or truck in each country would take care of this overhead for trade name sanctity.

As has been the case in other lines of trade, though, these appeals to take out trade name insurance overseas have for the most part fallen on deaf ears not only in the case of American manufacturers who have not entered the export market but likewise, too often, in the case of concerns that have been selling to only a limited extent outside the domestic market. Automotive men, engrossed with the home trade, have not even been swayed by the argument that lack of interest today in export markets does not mean that these outlets will not be needed tomorrow for the surplus products of American factories. And, in this connection, officials of the trade associations have sought to draw a parallel by recalling the object lesson of Iowa which was once scorned as an automobile sales field because of its lack of large cities but which now boasts a quota of one motor to every six inhabitants.

N. A. C. C. Plans to Register All Members in All Countries

Convinced that trade-mark kidnapping is coming to a crisis and that individual initiative in the trade cannot be depended upon to provide the precaution of separate registrations, the National Automobile Chamber has under consideration a plan whereby the Chamber would on its own responsibility register the marks of all its members in all countries, paying the expense from the funds on hand and later seeking reimbursement by some form of assessment gauged in accordance with the service performed for the different members. Even this plan, simple as it appears on the face, has details that would need to be worked out carefully. For example there are countries, of which the United States is one, where trade-mark registration of the kind here contemplated, may not be made by an interest that is not a bona-fide "trader" and does not actually deal in or have in its possession the goods that bear the marks that are involved. However, it is surmised that all such complications could be disposed of, perhaps by giving the national organization power of attorney for each trade-mark owner.

While concerted action, along the lines indicated, would probably meet the situation very satisfactorily insofar as are concerned the motor truck interests that are affiliated with the National Chamber it leaves to their own devices the owners of trade-marks in the motor truck accessory and supply fields. This is an aspect of the situation worthy of attention because the affiliated lines seem to be almost as tempting to the trade-mark pirates as the truck and automobile sections. When Richard Mittler, an Austrian, undertook a couple of years since, his rather memorable adventure in piracy it was a baker's dozen of American tire manufacturers who were his victims. To be sure, it seems likely that the peace treaty will, fortunately, afford a means to undo the harm worked by Mittler who has the status of an "enemy subject" but evidently accessories and equipment have conspicuous place in the pirate's eye. Indeed, among the applications made during the past month for registration in Brazil, that happy hunting ground for trade-mark poachers,—applications that may or may not have the sanction of the American owners,—there are noted "Whitney" for transmission chains, "Michelin" for air pressure pumps, "Red Seal" for electric dry batteries, "Inland" for piston rings, "Exide" for storage batteries, "Samson" for auto horns, "Edison" for storage batteries, etc.

With the automotive trade-mark piracy that has been rampant in Latin-America, spreading to Europe, many men in the motor truck industry and affiliated lines have raised the question of why this industry should be "picked on" for hold-ups of this kind. The conundrum is, of course, impossible of answer except by conjecture. When the riddle was passed, by the writer, to the U. S. Government officials at Washington who have in charge the current campaign to checkmate the automotive pirates they advanced several theories to account for the concentration of piratical activity. For one thing, it was surmised that the rapid development of the industry with the consequent additions to the roster of accepted trade names might seem to imply rich pickings for the pirates as compared with old industries where the popular trade names are of long standing and have probably been duly protected in all the principal countries. Even more plausible is the theory that motor marks have tempted the pirates because automotive products are advertised more extensively and more impressively than any other class of wares. It is well known that trade-mark pirates, looking for prey, make it a practice to regularly scan the advertising pages of leading American periodicals in quest of new prospects. The new-found automotive trade name that is exploited in large space is instinctively seized upon in the confidence that if there is sufficient capital behind the enterprise to make a flying start in the American market it will be only a question of time when the export field will be entered and when the unsophisticated manufacturer or marketer will have to "buy back" his trade name from the "squatter."

U. S. to be Represented at Berne Trade-Mark Convention

Reaction already begotten of the wholesale attempts at trade-mark privateering is found in the increased pressure applied by automotive trade interests at Washington for the entry of the United States into all possible pacts that will result in co-operation for the observance of trade-mark rights and privileges. What the automotive men who have written to Washington on the subject specifically desire, of course, is that the United States shall become a party to the Berne Trade-Mark Convention. No wonder, Uncle Sam's position outside this particular league of nations is a sore point just now because it was due to the scheme of simultaneous registration in thirteen different countries fathered by the Berne Convention that the present Carmo piracies and the Mittler raid of some months ago proved so disquieting to executives

in the automotive field. That the United States is not a party to this particular trade-mark round robin is a matter for chagrin because Uncle Sam was very active in the preliminary interchanges at Madrid out of which grew this system of automatic registrations. Furthermore, to make the situation the more awkward, Mexico,—a country where trade-mark piracy has latterly taken on more menacing form,—is a party to this arrangement. However, Congress has not, to date, shown any disposition to join the circle at Berne.

At that, however, our national legislature, responsive perhaps to the current agitation in the automotive industries, is manifesting a disposition to do its part to put an end to trade-mark piracy in the New World. Within the past few weeks the House of Representatives has passed a bill to give effect to that give-and-take arrangement known as the Convention of Buenos Aires and, inasmuch as the U. S. Senate is favorable to the proposition, it is to be expected that this republic's acquiescence will be forthcoming. The Buenos Aires contract calls into existence a trade-mark league of the Americas whereby deposit of a trade-mark in central registration bureaus at Habana and Rio de Janeiro will operate to secure for the mark protection in all the various countries that make use of these clearing houses. As a matter of fact, the launching of this enterprise has not waited upon the final action by our Congress at Washington. The Habana registration bureau is already open for business and several hundred American trade-marks, including a number of automotive marks, have already been deposited there but some doubt is entertained whether inter-American protection can be claimed until the U. S. Congress has formally given full legislative approval.

Trade-mark scouts in the service of the National Automobile Chamber of Commerce or who are acting for individual interests in the automotive industries universally deprecate, however, the present disposition of many men in the industries to feel that if they can only get their marks or trade names on file at international registration bureaus, such as those above mentioned, all their troubles will be at an end. While recognizing and welcoming the added element of protection that these trade-mark leagues supply, the conservative advisors of the automotive interests continue to strongly recommend the time-tried expedient of separate registration in each individual country as the only policy that will make an American trade-mark bomb-proof. It was in accordance with this conviction that the U. S. Department of State recently recommended to each motor truck or automobile manufacturer whose name had been filed on by Carmo that he lose no time in registering his trade-mark or trade name in Portugal.

Representatives of the automotive industry who have recently visited Washington in connection with the foreign raids upon the industry's good will came to the conclusion, as a result of their investigations, that one reason why there is no panacea short of individual registration in each separate country is that no trade-mark alliance is sufficiently all-embracing to cope with piracy which notoriously thrives in small countries and in those where progressive ideals have not been adopted in the protection of industrial property. Were the United States a party to the Berne Trade-Mark Convention things would have been less easy for Carmo in laying his plans for plunder but, at that, the Berne Convention does not encompass more than a fraction of the countries on the globe. Similarly, the new compact for reciprocal trade-mark rights covering North and Central America and the West Indies which has its administrative headquarters at the newly-established bureau at Habana leaves something to be desired in the way of interlocking protection because some of the republics have not qualified as members of this "Northern Group." Conspicuously absent, forsooth, is our southern neighbor beyond the Rio Grande and whereas the Mexican market for motor trucks and accessories is not the equal of the Canadian market it is important to the truck industry that a halt be called south of the Rio Grande to the pirating of the commercial name of U. S. commercial cars.

Trailer Manufacturers Want Highway Laws to be More Uniform

TRAILER manufacturers hope that by furnishing information as to types, sizes and construction of trailers and the ways in which they are used, it will be possible to aid legislators in framing legislation that will protect the highways and insure the safety of all who use them without placing unnecessary obstacles in the way of development of the most economical means of highway transportation.

Recommendations for trailer legislation prepared by the Trailer Manufacturers' Association, with headquarters in New York, have been incorporated in a uniform vehicle bill which has been drawn up after two years of work by a special committee in Washington representing the National Association of State Highway Officials, the Highway Industries' Association, the National Automobile Chamber of Commerce, and the American Automobile Association. The provisions of this bill relating to registration and fees for all vehicles using the highways, size and weight, equipment and rules of the road were approved recently by national associations representing the automobile motor truck and trailer manufacturers, dealers and users.

This bill therefore represents the mature judgment of all factors most directly interested in and best informed with regard to the use of the highways as one of the vital means of meeting the transportation needs of the nation. The trailer provisions in particular are far in advance of any present laws or any bills now pending in about a dozen states where the legislatures are in session.

To avoid repeating the experience with motor vehicle legislation, which has resulted in forty-eight varieties of laws governing the operation of vehicles that are constantly engaged in interstate travel and commerce, the trailer manufacturers are calling attention of legislators and highway authorities to provisions of the proposed uniform vehicle act and asking that bills now pending and certain provisions of existing laws be amended to conform with the provisions of the uniform bill so that the work done now will not need to be undone at future sessions.

It is expected that next year when practically all states will hold regular sessions of the legislators, concerted efforts will be made to have the uniform bill introduced and passed.

Steps have been taken by the Trailer Association to have amendments introduced in the New York legislature granting to trailer manufacturers and dealers the same privileges of securing blanket licenses for demonstration vehicles as are enjoyed by truck and automobile dealers and revising the gross weight limitation of motor vehicles so as to allow a greater weight on the six wheels of a truck and semi-trailer combination than on a four-wheel truck alone.

A similar move is contemplated in New Jersey to amend the law which now prohibits the hauling of more than one trailer or semi-trailer with a motor truck. Cities in many states are beginning to use trailers for hauling ashes and garbage, sending them out singly, sometimes drawn by teams, to collect and haul to a central point. From this central point the trailers are drawn in trains of two, three or four by road tractors to dumps several miles from the center of the city. But the New Jersey law does not permit even city authorities to follow this up-to-date system and they want law changed.

Bills before the Massachusetts legislature seek to define "commercial trailers" and to fix the overall length, width and height of motor vehicles and to limit the length of a trailer train to 65 ft. The Trailer Association has urged the Department of Public Works, which had the measures introduced, to adopt the definitions in the uniform bill which distinguish between four-wheel trailers and two-wheel semi-trailers and to adopt the size limitations of the uniform bill which allows a width of 96 in., a height of 12 ft. 6 in., a length of 30 ft. for a single vehicle and a length of 85 ft. for the combination of a truck or tractor and several trailers. It is also urged that the present registration fee of $10 a ton of carrying capacity, which is the same for trailers as for trucks, be made less for trailers. A trailer weighs only one-quarter to one-third as much as a truck of equal capacity.

Heavy Snowfalls Bring Forth Many New and Novel Designs of Snow-Removing Appliances

THE task of maintaining an open highway for road transportation this past winter, which was unprecedented for its heavy snowfalls through many sections of the country, has been a surprisingly difficult one. Although the majority of the communities around the country were able to cope with the elements satisfactorily, there were many others which through lack of proper facilities were compelled to lay back, tying up transportation, and wait, depending entirely upon a rapid thaw for the reopening of the roads.



Snow-plow Designed and Built by C. M. Keck and His Employees

It effectively cleared the local streets and outlying roads of Glenwood Springs, Colo., of snow, making the continuance of road transportation possible. Mr. Keck who in seated alongside the driver, his son, is a prominent good roads advocate in this section

In former years the need of keeping the highways open was not as highly important as it is today. The rapid strides made in motor highway transportation has made imperative the need of open roads 365 days of the year. Tying-up the main highways today will unquestionably result in a traffic congestion with its accompanying losses and suffering, similar to that which would occur if the railroad centers were tied up for an indefinite period.

This year the probability of possible losses for those directly connected with the transportation business or kindred businesses stimulated them to make special efforts in the matter of retaining clear highways. The result of these efforts has been the creation of innumerable snow-removing appliances, some of which were found to be very satisfactory upon being put to practical use and others, due to lack of knowledge of proper mechanical construction, were complete failures.

The snow plows as brought forth this year, may be divided into three general classes. The type which is almost universally used is that similar to the farm plow share. which is mounted directly in front of the truck and which cuts into and pushes the snow aside. Another design is that which incorporates a furnace, melting the snow and ice as it travels forward. Still another type is one which gathers the snow and ice in front of the truck carrying it up to the top of the body by conveyors, where it is either stored until carried away by auxiliary trucks or is cast out of the body through the sides and over the snow banks into the gutter. Many interesting and practical points in the construction of snow-removing devices are brought out in the following review of some of the most important types.

A heavy snowfall in Glenwood Springs, Colo., which practically blocked the main thoroughfares between the two most important centers in this vicinity, required immediate removal in order to permit the unhampered continuance of motor truck transportation between these centers. Mr. C. M. Keck, one of the leading good-roads men of this section, attached a snow-plow on a Nash Quad truck borrowed from the county and not only cleaned the roads but the local streets as well. The success of this job both from an economical and practical standpoint conclusively convinced the county highway commissioners that an appliance of this type should be included in the highway repair equipment.

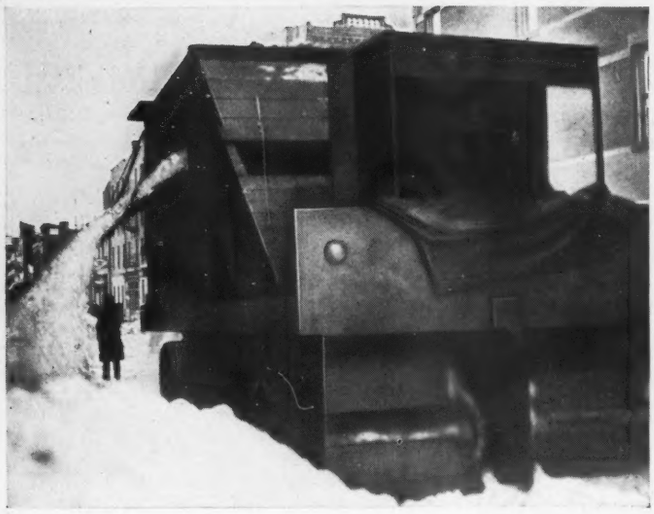
The plow is 10 ft. wide at the rear end and is 3 ft. high. The sides are curved somewhat similar to a plow share which not only pushes the snow away but throws it out. Any amount of snow can be left on the ground as the plow can be raised by a chain to any height. The feature of this plow is that it is prevented from swaying at the sides by a heavy square frame which in turn not only increases the strength of the plow but secures it rigidly to the front axle of the truck. The total weight of this plow is 400 lb. and no trouble is experienced in steering it through heavy drifts. No. 16 galvanized iron is used to cover the sides and the nose is protected by part of an old automobile frame, and is curved upward slightly so as to enable the plow to slide over inpenetrable obstacles.



Boulevards and Other Outlying Roads Can be Cleaned Rapidly, Effectively and Economically by This Machine

The snow is drawn into a rapidly-revolving device which separates the element into fine particles, casting it from the body with a terrific force in a fine spray

The improvised snow-plow was given a severe test when it penetrated 10 miles into a snow-bound canyon, permitting several hundred cattle and horses to be driven through. Mr. Keck states that if the plow is used immediately after a snow



This Unique Job Was Utilized With Much Success in New York

The frozen element is gathered by conveyers and carried to the body of the truck from whence it is either collected by auxiliary carriers or cast out of the side.

storm, it will have no trouble in removing the snow and keeping the highways open. He is the proprietor of a large garage and is now arranging to have his workmen build a rotary snow-plow attachment which will be tested after the next big snow storm.

Knox Tractor Empowers Fisk Snow-Plow

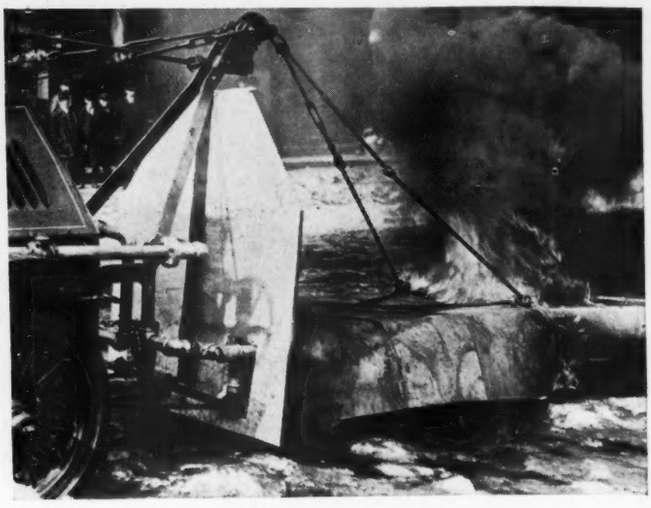
In trying to maintain an open highway for road transportation between Chicopee Falls and Worcester, Mass., the Fisk Rubber Co. used a 40-hp. Knox tractor, which not only carried its own load of 2½ tons but pushed the plow as well. After each of two recent storms this machine was in operation day and night, requiring two shifts of three men each, and it plowed a 20-ft. swath the entire distance between Chicopee Falls and Spencer, a distance of over 40 miles. The most discouraging obstacles, in the way of drifts, which frequently were successfully met among the hills surrounding the Brookfields, topped the radiator.

Frozen Drifts Almost Impregnable

The second storm was accompanied by a thaw, immediately followed by a cold snap which caused the snow to freeze solid. The fence-high drifts of this solidly frozen snow presented difficulties which were almost unsurmountable. Sometimes an hour or two would be consumed in making head-on collisions into this hard mass, backing away and plowing into it again, time after time, cutting only two or three feet at each onset. Through such banks only single-width paths were plowed, but extra broad turnouts were made on each side of such narrow cuts so that there might be no possible chance of any traffic congestion.

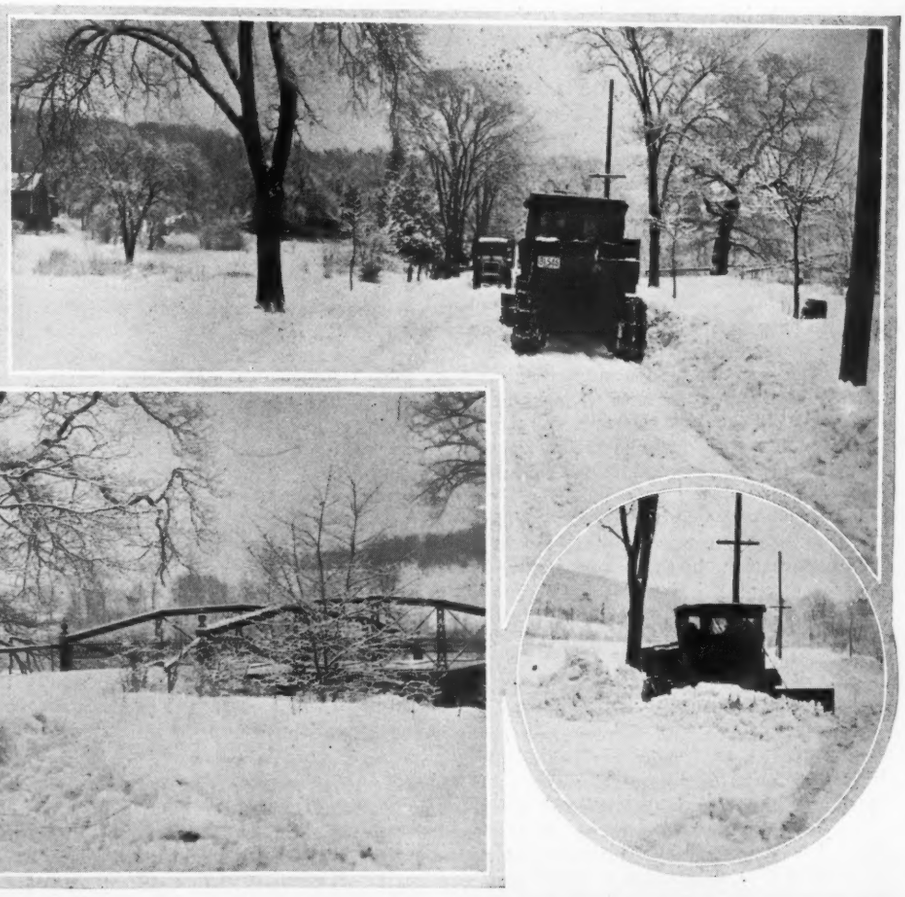
This broad, smooth roadway finished, a good-sized touring car could easily travel from the Worcester City Hall to Court Square, Springfield, in two and a half hours, without a single shifting of gears. This illustrates the great changes which have taken place since industry demanded the year-round use of inter-urban roads. The New Englander no longer needs to put his car into dead storage at the first signs of snow, but can enjoy its use 12 months in the year—thanks to industrial requirements.

By the use of new and second-hand material an engineer of Flathead County,



Oil-Burning Snow Melter Mounted on a Mack Truck

Two pipes extend in front and crude oil from an 1,800 gallon tank is forced through the pipes while burning.



This group of scenes show the valuable service rendered by a snow-plow mounted in front of a 40 h.p. Knox Tractor in keeping the roads open through the country immediately surrounding the works of the Fisk Rubber Co.

Mont., equipped the county motor truck with a snow-plow.

Heavy-Duty Snow Plow

Across the front end of the truck was bolted a heavy timber. To this the plow was hung with heavy double hinges. The pointed and narrow nose was built of heavy timbers, faced with 2 x 4 in. timbers and covered with heavy sheet tin. Quarter-inch steel was used in making up the cutting edge. From a perpendicular timber 6 x 6 in. extending from the nose of the plow, the block and tackle was attached extending to the rear of the truck. By means of this device the plow can be elevated to any level.

Spreader boards were attached on both sides of the truck. As the spreader boards are suspended from a heavy timber bolted across the back, they may be raised to avoid striking poles, fences, etc. The spreader boards are used to push back to the sides of the road the ridges left by the plow. Although the plow weighs between 700 and 800 lb. it is not carried entirely by the front of the truck as part of the weight is transmitted to the rear by the tackle arrangement. Gasoline, oil and tools are carried in the body of the truck. The truck, plow and equipment weigh about six tons.

Unique Snow-Gathering Plow

The big snow storm in New York brought out a strange snow-removing device and the inhabitants as they plodded through the trolleyless streets found entertainment in watching the operations of this new appliance.



The Midwest Engine Company Took Advantage of the Versatility of Its Product, Utilizing Its Power to Clean Its Factory Walks.

This snow-removing machine was a 20-ton truck equipped with 40 x 12 United States solid tires and provided with mechanism which enabled it to eat its way into a snow drift, the snow being carried up into the truck body and then ejected down a chute to the gutter or to a smaller truck running along side. The National Snow Removing Co., owners of the truck, stated that the tests showed it capable of removing 9 cu. yd. of snow a min. It is said to travel 5 m.p.h. in from 3 to 4 ft. of snow, making a swath 11 ft. wide, throwing the snow 20 ft. clear of the truck.

Novel Snow-Melting Appliance

One of the most novel innovations for snow removing was the oil burning snow melter, shown mounted on a Mack 7½-ton truck, brought out in Brooklyn, N. Y. It is the invention of L. V. Stevens, a Canadian engineer, and was first used successfully by the Canadian Pacific Railroad to clear its tracks.

The truck which carries an 1800-gal. tank of crude oil travels at the rate of 5 m.p.h., belching an incandescent flame some 10 ft. ahead, collapsing snow banks as if by sun stroke. The oil and air are both forced ahead under compression through a mixer or carburetor, in a manner similar to the practices established in the case of blast furnaces and oil burning locomotives.

Recourse is Even Made to the Tractor

The Midwest Engine Co., Indianapolis, Ind., in clearing its walks about the factory after a heavy snow storm utilized one of their products, a Utilitor tractor, to supply the power necessary to push the snow plow by which device paths were made about the neighborhood.

Capacity Crowds Greeted the Opening of Shows in St. Louis

The Thirteenth Annual Automobile Passenger Car and Truck Show opened simultaneously on the night of the 15th of February to capacity crowds at the Exhibit Building (old Southern Hotel) and the Coliseum. This show was staged under the auspices of the St. Louis Automobile Manufacturers' and Dealers' Association during the week of February 15th to 20th.

The Motor Truck Show at the Coliseum, which is the first of its kind ever held in St. Louis, included nearly every type of commercial vehicle now being utilized. At the Coliseum, accessories for the trucks were exhibited.

The great amount of detail work connected with the staging of the first double header automobile show ever held in St. Louis, has been directed by the Show Committee of the St. Louis Automobile Manufacturers' and Dealers' Association. Joseph A. Schlecht, president of the Schlecht Motor Car Company and the Mound City Auto Company, is chairman of the committee, and the members are G. W. D. Donnelly, of the Supreme Motor Company; P. H. Brockman, of the DeLuxe Auto Company, president of the Dealers' Association; L. H. Amrine, of the Scudder Motor Truck Company, for the commercial car interests, and Robert E. Lee, secretary of the Dealers' Association and manager of the show.

Total Registration of Commercial Cars

For Calendar Year 1919

State	Actual	Estimated
Alabama		7,690
Arizona		3,714
Arkansas		6,338
California		60,690
Colorado		14,098
Connecticut	18,900	
Delaware		2,070
Florida	7,239	
Georgia	9,170	
Idaho		5,419
Illinois		61,717
Indiana		35,533
Iowa		47,419
Kansas		29,298
Kentucky	9,105	
Louisiana		6,536
Maine	5,792	
Maryland	10,806	
Massachusetts	41,753	
Michigan	37,105	
Minnesota		33,289
Mississippi		6,152
Missouri		32,800
Montana		7,601
Nebraska		25,632
Nevada	500	
New Hampshire		3,846
New Jersey		24,252
New Mexico		2,315
New York	96,115	
North Carolina		14,856
North Dakota	1,314	
Ohio		65,528
Oklahoma		19,391
Oregon		10,680
Pennsylvania		62,842
Rhode Island	7,100	
South Carolina		8,990
South Dakota		13,409
Tennessee		10,307
Texas		41,139
Utah		4,505
Vermont	2,402	
Virginia		12,066
Washington		22,428
West Virginia		6,434
Wisconsin	10,888	
Wyoming		2,739
District of Columbia	7,163	
	265,352	711,723
Grand Total	977,075	

State Commissions Receive F. W. D. Trucks From the Government

Of the 15,000 military trucks turned over to the government by the Four Wheel Drive Auto Co., Clintonville, Wis., makers of the FWD, there now remain more than 2000 machines, as a surplus. These are being shipped out at the rate of one hundred per day from storing centers in Chicago, Indianapolis and Ft. Monroe, Va. The effect this fleet of trucks, including others of virtually every well known make, will have in the better roads' movement, is easily apparent when it is considered that the total number declared surplus amounts to approximately 25,000.

Small-Town Truck Dealer in Iowa Writes Advertisements That Convince Farmer Prospects

By A. V. COMINGS

Thomas Foster, of Foster Auto Co., Guthrie Center, uses pictures of his well-known farmer users with facts and figures of what the truck has done for them. City-made advertisements don't fill the bill for him. When "Rube" Shoesmith, widely-known farmer, is satisfied with truck, Foster tells prospects of it through newspaper publicity.

NEWSPAPER advertising of motor trucks in farming communities has not been given the attention the subject deserves, especially by the advertising executives of the motor truck manufacturers. The manufacturers have spent unlimited sums in preparing advertising matter for various types of publications, from magazines of national circulation down to mediums of local interest, and for the various trade publications through which they plan to reach the dealer. But the "copy" prepared for the use of country dealers in reaching their prospects through their local newspapers has not, in many cases, been given the intelligent treatment that usually marks the preparation of copy for the larger mediums.

Some Typical Examples of Non-Appealing Copy

For instance, of what real use to the country dealer is a copy layout, with cuts or "mats" furnished, showing the truck he sells engaged in unloading merchandise alongside a ship, with all the surroundings and suggestive details of a type absolutely foreign to anything the farmer meets with in his daily life. And, incidentally, a scene that very very few farmers have ever seen, if the truth be told.

Or, taking another example, showing a motor truck engaged in heavy work around a big manufacturing plant of some sort, with the big buildings, the tall, smoking chimneys and all the surroundings one would expect to find in such a picture.

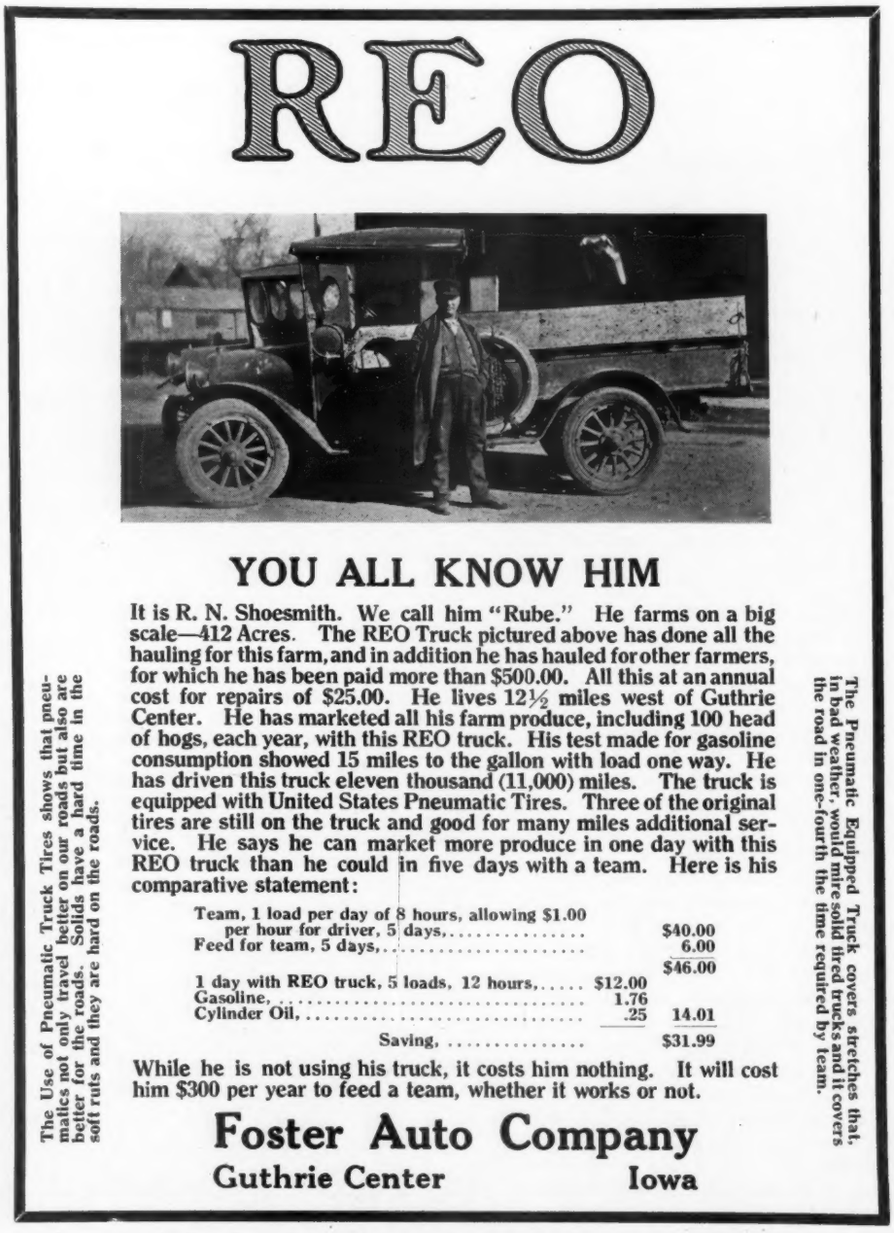
With each of these pictures goes, of course, elaborate descriptive matter telling of the remarkable records made by the truck in question handling merchandise over city streets to the wharves, or transporting factory products or raw materials within a short radius of the manufacturing plant.

The farmer prospect is not interested in what a motor truck can do in handling merchandise to the ship, over city streets, or in helping the big manufacturer to cut down transportation costs. Each of these types of service are absolutely foreign to the demands he would make upon a truck in his daily farm work, yet I have actually seen this type of advertisement frequently in looking over the advertising matter in newspapers having local farmer distribution. And these were framed to help the country dealer in disposing of his trucks to farmers.

Unfortunately, most motor truck dealers in the farming centers, have not the ability to write good advertisements for their local papers, their talents run in other directions. And, not knowing how to prepare real sales "copy," they use the material the manufacturer sends them and the money they spend on advertising is not at all a good investment.

Out in Guthrie Center, Iowa, there's a motor truck dealer who thinks for himself, however, and he decided some time ago that the kind of advertising the country truck dealer usually pays his good money for wasn't the kind he wanted to buy. Thomas Foster is this dealer's name, and he sells more Reo light trucks than any other dealer in the State of Iowa. Farmers are his principal customers and to them he addresses his frequent advertisements in the Guthrie Center newspaper. He writes his own advertisements, no "advertising expert" at a desk in a big city office can write his copy any more.

Each advertisement carries the story of a truck owned by some farmer or small town user, usually some man who is well



Facsimile of an Advertisement Run by the Foster Auto Company

There's a lot of human interest and plain facts in this copy. This is the kind of newspaper advertising that has made money for the Foster Company, because it appeals to the farmer. It talks to him in his own language. Actual size of advertisement is four columns

known through the length and breadth of the county. It tells of actual, concrete haulage examples of the kind the farmer meets with in his daily work; the kind which would make him want to buy a truck. And the story, with the figures on haulage costs, little details as to the tire mileage, etc., coupled with the picture of the man and his truck, strike right home to the farmer prospect, for here is something in his own language, something he can turn over in his mind and test out from his own experience along similar lines with horse-drawn transportation.

Take the advertisement reproduced herewith, for example.

"You all know him," right at the start, under the picture of "Rube" Shoesmith, a successful farmer working a 412 acre farm. Sure they all know "Rube" Shoesmith, and they know that if he tells them that his motor truck is proving a good investment that it is about time for them to look around and get into the up-to-date transportation band wagon themselves. "Rube" tells them that he has driven his truck 11,000 miles, that three of its original pneumatic tires are still on the truck, and that he can market more produce in one day with the truck than he could in five days with a team. (And right about here the wise farmer will begin to think of what this could mean to him in getting his produce to market when the price is high and apt to drop suddenly).

The whole advertisement, with the cost figures and the other data, gives the farmer prospect something to think over very seriously.

And right down at the bottom of the advertisement, the statement that the truck costs nothing while loafing, and that it would cost "Rube" $300 a year to feed the team, work or loaf, gives the farmers something more to think about, something that "Rube" has already thought over and found a very good reason for investing in a truck.

Other advertisements of the Foster Auto Co., are along similar lines, each one showing a picture of some well known farmer and giving a record of his accomplishments with Reo trucks. One recently told of the marketing of clover seed at a propitious time with a truck, the several loads being hauled into town in one day, whereas it would have taken five days to do the work with a team. And heavy rains the day after the truck completed the work made the roads impassable for horses, which would have left the farmer truck owner wtih most of his crop unmarketed, had he been depending on the horses.

Stories like this make the farmer think as no city-conceived advertising copy ever does, and Mr. Foster has gotten such excellent results from his sensible publicity that Manager Harter Hull, of the truck department of the Sears Automobile Co., of Des Moines, who distribute the Reo truck in central Iowa, is urging all his country dealers to use similar copy in their local newspapers to promote truck sales among farmer prospects.

The plan is an excellent one, and well worth using in every community where farmers are the big truck buyers or the logical prospects.

Determine the Motor Truck Customer's Hauling Requirements

I MAKE a survey and analysis of a customer's requirements before recommending a certain size of truck for his use," explained a Western dealer. "Fully three-fourths of my sales are made to farmers. The farmer who is interested in a motor truck desires to know what it can do on the road, and the kind of service it will render on the farm. Before a farmer invests in a truck, he desires proof that it will prove a profitable investment, returning both the purchase price and a fair profit on the investment. Before a salesman can determine whether a certain farmer can use a truck to advantage, it is necessary to review the farmer's undertakings, and give careful consideration to several points.

"Accurate information on the following questions is of interest to the prospective customer:

"How much time can he save on the road, and how many less trips will he be obliged to make?

"How much more time can he give to his farm after buying a truck?

"How many horses can he sell, and thus cut down the feed bill?

"How much can he save on hired help?

"Can the truck assist him in selling produce to greater advantage, by permitting him to go farther afield in search of new and larger markets?

"Will the use of a motor truck enable him to devote a larger acreage to the production of perishable produce, which is profitable only when speedy marketing is possible?

"How much can he save on live stock shrinkage?

"How great a percentage of produce which has been going to waste, could be saved by the use of a motor truck?

"Will the use of a truck assist him to market produce direct to the consumer, gradually eliminate the middleman, and increase his profits?

Size of Truck and Body Important

"The size of truck required by a farmer depends upon several considerations, chief of which are the nature of the crops he grows, the kind of live stock he raises, and his methods of marketing produce. A truck of the right size for the work expected of it will outlast two trucks which are too light for their owner's work. It is essential that the farmer select the right type of body. I have known instances where the use of the wrong kind of body cut down the profit-making possibilities of trucks. A survey of the prospect's farm shows the type of motor truck body required. The majority of farmers desire to utilize the maximum capacity of their trucks, and provision should be made for this when selecting the bodies. Statistics on transporting farm produce by motor truck shows that much bulky material is hauled. Hay averages approximately 13 per cent. of the farm produce transported by motor truck. Corn averages 11 per cent. Wheat averages 10 per cent. Oats average between 7 and 8 per cent. Beef cattle average between 3 and 4 per cent. Hogs comprise 3 per cent. Milk averages approximately 25 per cent.

"The fact that transportation by motor truck, cuts shrinkage from 3 to 8 per cent. in the case of hogs; and from 3 to 4 per cent. in the case of cattle, is of interest to raisers of live stock.

"I find it easier to determine the needs of a man who specializes on fruit growing, vegetable production, poultry raising or dairying, than the requirements of the general farmer. Truck gardeners can use motor trucks to good advantage. They not only have a great deal of perishable products to market; but also have occasion to haul fertilizers, spraying materials, crates, boxes, barrels, etc., to the farm. The nature of a truck or fruit farm makes it advisable to use mechanical power for transporting produce, in place of buying expensive feed for horses.

"It is easy to determine that the dairy farmer whose herd produces a ton of milk per day can use a motor truck profitably. A farmer whose herd produces a smaller amount, can use a truck to advantage by bunching his loads, and transporting other products when the milk is hauled. Many dairy farmers, who have been hiring some one to haul their produce, are deciding it is more profitable to own trucks, use them for milk hauling, and have them on hand for other work.

Complete Motorization of the Farm

"Meeting the requirements of the general farmer is usually more difficult. I search for motor truck buyers among farmers who have bought tractors, and have learned the advantage of employing mechanical power for farm work. The power farmer cannot dispense with the services of a good motor truck, if he is working for maximum efficiency. In most up-to-date farming communities there are farmers who have eliminated waste time and labor on their farms, with the exception of hauling produce. Men of this type are good buyers of trucks. The logical course for them to adopt is to eliminate unnecessary waste of time, and other losses, when hauling produce to market."

Dealer Tells How to Merchandise Trailers

The Live Dealer Can Make Good Money Selling Trailers. Must Study Topographical Conditions in His Territory and His Customers' Requirements

By C. S. PERRIE

AN Eastern dealer who has achieved considerable success in the merchandising of trailers said, in discussing the subject that the trailer affords the motor truck dealer an opportunity for greatly increasing his profits. "The motor truck trailer is no longer an experiment," said this dealer, "but is accepted as a useful and in many cases a necessary adjunct to the truck. The demand for trailers is steadily increasing and there never was a better time than the present for the dealer to incorporate into his line a good trailer."

"A dealer deciding to take on trailers will do well to relinquish the thought that anything will do for a trailer. Anything will not do. It must first of all pull easily and should absolutely track the towing vehicle and be capable of being steered in backing. If the dealer is not willing to take these facts for granted let him investigate, and after he has done so, he will, without doubt, come to the conclusion that a trailer is not merely a vehicle to hook in back of a truck.

"By selecting the product of a company whose name and character are known in his territory the dealer will be saved much missionary work and his overhead will be lightened. Select a firm that advertises, a company that will give support in circularizing, supply catalogues, printed and advertising matter, cuts, etc., and will share the expense of local advertising as well as furnish data on the use of trailers in other territory. This data should include cost figures and illustrations of trailers in service. Photographs should be what is known as action pictures showing the trailer being loaded, etc., not some pretty picture of a trailer in back of the truck and the employees stacked around with their best Sunday expression.

Analyzing the Models

"One of the problems confronting the dealer is what and how many models should he stock. This requires careful consideration. The number will depend upon the extent of the territory and its character. For example: If he were in a thickly populated territory where there were a number of manufacturing interests, the roads good, and the farmers up-to-date, the dealer is warranted in stocking at least two of three models. The tonnage of carrying capacity of the models should be determined by the character of the country and the number of motor trucks of a given capacity in the territory. For example: If his territory embraces a flat, level country with good roads, there will doubtless be a number of 5-ton trucks, and 5-ton trailers would be logical. On the other hand if the country is hilly and the roads are not good, it will be found that trucks from one to three tons capacity predominates, and trailers of that capacity should be considered.

Prospects Unlimited

"A list of trailers in service will disclose the interesting information that there is a wide diversity of uses to which the trailer may be employed and that every conceivable kind of merchandise is being hauled over the highways in trailers. One of the strongest selling points with trailers is that they permit of hauling what is termed a diversified load; that is, the truck can carry one commodity and the trailer another. For example: It is not uncommon in some sections of the country for the truck to carry groceries and the trailer pigs. Motor highway companies can make good use of trailers where mixed loads prevail and this is true in parts of the country where there are not large manufacturing interests and the dealers feel that there is a limited field for trailers. The mixed load feature appeals to farmers for they can carry the milk or produce on the truck and the live stock on the trailer, saving an extra trip.

How to Get Prospects

"The problem of prospects and how to obtain them is not a difficult one. A truck dealer should have a pretty good idea of the motor truck situation in his territory. He should know every truck owner and every one is a potential trailer owner if he will see that way. If the truck dealer does not know the truck owners in his territory, there are various means by which he can get them. The best way is to go after them. If the territory is a large one, a list of the names can be obtained from the registration department of the State or from concerns making a specialty of listing trucks.

"The successful trailer dealer will not confine his efforts to truck owners alone. He should endeavor to sell the trailer idea to every farmer, merchant and manufacturer in his territory who is using horses to adopt motor trucks and trailers. And there are many installations of motor trucks that would never have been made had it not been shown that without the use of trailers with trucks the truck alone would not be profitable.

"The trailer dealer will run up against some queer statements and objections on the part of his prospects. They will tell him the same thing that they have told the truck salesman sometime back, that trailers are a good thing for some lines and for some firms, but their business is so peculiar that they will not fit in. They will also tell him that the trailer is good for long hauls but not good for short hauls. Objections such as these should not confound a live dealer, for he has too much ammunition these days to allow any such objections to thwart him.

"Some of the most successful and profitable uses of trailers are on what is known as the short haul. The live dealer can point to many concrete examples where railers are employed exclusively for inter-plant work. On the long haul the dealer has the edge on the prospect for it is not a difficult matter to prove in majority of cases that trailer load is all velvet.

"The dealer in solicitating business will find it an asset to sales to investigate his prospect's particular problem before he advocates and recommends the use of trailers. He should ascertain the make, carrying capacity and condition of the motor truck that his prospects own and if they do not own any, must point to the prospect the particular type of truck that would work best in conjunction with the trailer. This does not mean that he should advise as to the particular make of truck, but solely as to the type that would best fit in the prospect's service. Due consideration should be given to the character and gradient of the highway over which the trailers are to run.

"There are some sections of the country where conditions are favorable and where trucks of from 2½ to 3½ tons are successfully employed hauling trailers of five and six tons capacity. There are, however, other sections where it may be advisible for trailers of two and three-ton capacity be used with 5-ton trucks. The average practice is to have the trailer of the same capacity of the truck. However, the manufacturer of the trailer should supply the dealer with grade charts showing him how to arrive at the tractive force of any motor truck engine that is on the market, and by a careful consultation with the data and information furnished the dealer should be in a position to advise intelligently any of his prospects as to the practicability and possible profit of a trailer installation. A broad-minded dealer will frankly advise his prospect if it be found that a trailer is not likely to prove feasible and profitable.

Following Up the Prospect

"After the trailer is installed the dealer should not let the matter rest with the sale. The dealer should follow up with the same care and attention as a truck installation should be followed up. The dealer or his salesman should be on hand the day the trailer is placed in service, and if necessary spend a day or two to see that the driver of the truck and helper are thoroughly initiated as to the handling of the trailer.

"An intelligent driver should be able to master the details of handling a trailer in half a day, for the only real feature in the handling of a trailer that is likely to prove puzzling to the driver, is the backing. This can be mastered in half a day. Due care must be taken in starting a truck with a trailer attached and in braking on descending grades. In going

straight ahead the driver can forget he has a trailer in tow for the modern trailer will track the truck."

Trailer a Small Freight Car

"There are so many uses to which the trailer can be put that it would take up too much room in your valuable journal," remarked the dealer in a reply to the writer's question as to the use of trailers for replacing freight cars on hauls within the scope of the truck. "The trailer," continued the dealer is in reality a small freight car and should and is going to be used along the same lines as freight cars are being used. In other words, trailers will eventually be employed to haul through loads, and this means that more trucks are going to be sold. Just consider what this will mean to the large manufacturing plants who want quick delivery to their large clients or to their warehouses in cities 20 to 50 miles away from the plant. The trailers could be loaded at the manufacturing plant at the convenience of the traffic department, and the trucks could start them and relay them to their destination without having to take long and expensive trips themselves. This same feature can be adopted by farmers and milk dealers, and the return load feature could be worked to the n'th degree."

Good Service is Essential to Sales

There is one point on which the dealer touched and that was the necessity of a dealer taking on a line of trailers to carry in stock at all times an adequate stock of parts. This feature is no less a factor in selling trailers than it is in merchandising motor trucks.

The First British Six-Wheeled Combination

American Practice Being Introduced in Europe

ALTHOUGH examples of the American tractor and semi-trailer arrangement are not uncommon in the eastern hemisphere, until recently they have all been imported from the United States. Chenard Walcker, of Paris, has begun to turn out a small machine on these lines, but the example here illustrated is the first to be made in Great Britain. It is the practical outcome of the long experience which its makers, Scammell & Nephew, Ltd., have had with heavy trailer hauling trucks for the past fifteen years or so.

The machine is described as a six-wheeled truck, capable of carrying 17,500 pounds of paying load without putting as much as six tons weight on any one axle. It can take a trailer carrying an additional 13,500 pounds useful load, making a total of 31,000 pounds in all.

Briefly the tractor is equipped with a Scammell 45 h.p. engine having cylinders of 5 x 5½-in. cast in pairs. In each pair cylinder barrels and head are separate and with the valves placed overhead the combustion chamber can be machined all round. Also the ports offer a stream line flow to the gases. The overhead valves are worked by ordinary rockers actuated by long push rods running upwards through passages exteriorly cast on the cylinder walls. At the top the whole motion is cased in. These passages serve a dual purpose; one—to enable oil to reach the crankcase when poured into the rocker casing; two—to act as a passage for crankcase oil mist to lubricate all valve gear. The oil is poured in to the valve casing at the top of the engine, swamps the valve motion and drains to the crankcase. Oil is supplied to the bearings at 15 lbs. per square inch pressure by a very solidly constructed pump—the gears measure 1¼-ins. wide—and all oil passages are cast in the crankcase; no pipes are used.

The case, which is of aluminum, is stifly ribbed and extremely short, carrying a three-bearing crankshaft and a point in construction is that the flywheel does not extend beyond the crankshaft, the rim being brought back well over the back bearing.

Except for these points the engine follows usual practice having a Watford magneto and pump and water circulation fan cooled. The radiator, however, is mounted on rubber washers on the front cross member so that no frame distortion can affect it.

The internal cone clutch and three-speed gearbox, too, call for little remark beyond saying that the latter contains no keys, nuts, bolts or other possible loose pieces, and is mounted on the sub-frame with the engine. Shafts are very short and stiff and run on large ball bearings.

Separate from and behind the gearbox a jack shaft in a cost steel casing is driven by bevel so that it in turn can drive back tractor wheels by side chains.

The floor boards under the driver's seat and at back of the seat are detachable, so that when these are removed the whole chassis is practically stripped.

Other items such as steering, springs and frame follow standard practice, while the fifth wheel calls for little remark except to say that through the center of the turntable the operating pin for the carrier brake is put, and underneath this is carried the bell crank and flexible connection for coupling to the hand brake lever at the driver's side. This flexible connection is ⅜-in. in diameter and takes a braking stress of about seven tons.

The whole combination constitutes a remarkably effective and workman-like job which strongly suggests that the makers have profited generously by experience with American-made machines.



Latest Production of Scammel & Nephew, Ltd., Great Britain
This side-wheel truck can carry a pay load of 17,500 lb.

City Traffic Will Demand Truck Freight Terminals

Freight terminals designed and operated exclusively for motor trucks in the large cities of the United States will be the next stage in the development of highway transportation, according to R. E. Fulton, vice-president of International Motor Co., manufacturers of Mack trucks.

With the increase in the number and capacity of highways will come increased demands upon the traffic resources in cities. Since it is practically impossible to build more city streets or to widen them, it will be necessary to distribute freight more efficiently. This can be done by establishing motor truck freight terminals for handling small shipments, similar to the railway terminals, each to serve as a clearing house where outgoing and incoming loads can be assembled and distributed. Such a system implies the co-operation of the motor express concerns both in delivering merchandise and in obtaining return loads.

Motor truck freight terminals would thus be a benefit to both the motor express concern and to the city—to former by lowering delivery cost and insuring return loads, the latter by providing a means for offsetting traffic increases.

The Value of Highway Transport Surveys*

By F. VAN Z. LANE, Chief Transportation Engineer, Packard Motor Car Company, Detroit

IN the field of highway transport there has been a colossal number of failures and reports of new transportation companies that have failed are received almost daily. If these debts, the money losses represented by these failures--failures due in a large part to the absence of transport surveys—were the sole reason for the development of such surveys, their value would run into millions.

Insurance against failure is, however, but a small part of the real value of highway transport surveys. Many companies in existence today would, if such investigations were generally resorted to, be able to render greater service to the public and make increasing profits for themselves. And these surveys would undoubtedly establish the desirability of highway transportation lines where as yet no thought has been given to such lines.

The prevalence of failures, paralleling the failures in the automotive industry in its early days, and the number of lines that are operating with a minimum of benefit to themselves and to their public, indicates the most cursory analysis of the territory to be served, or no analysis at all. Many firms are floundering without chart or compass and we should all do all in our power to correct the prevalent opinion that all that is necessary is to buy a motor truck of any make you please and any capacity offered, to start it operating over any road available, during any time of the day or week when the driver feels like it, and to charge any price for his services that may come into his head just so long as it is lower than any other price charged for transportation between the points in question.

Discussion of Transportation Timely

We are considering the value of highway transport surveys at a time when many business problems of vital importance are pressing for solution. Living costs are high. Labor is scarce. The railroad car shortage is acute and the thousand problems of production are crowding in upon us daily. In all of these problems of our complex business life, there is no factor that affects every phase of economic activity more fundamentally than does transportation. Highway transport surveys are, then, not only desirable, but at the present juncture of business conditions, fundamentally necessary.

If we are to survey the field in the broadest and most constructive manner, we must do so in conjunction with a survey of other and longer established means of transportation, especially the steam and electric railways. As an aid to these already existing systems, extending their usefulness in many territories, and even replacing them where such practice proves economically desirable, the motor truck has a tremendous field of usefulness. Just where this usefulness begins and ends, how to cover all territories thoroughly and yet avoid duplication of effort can only be ascertained by complete and far-reaching surveys.

Railroads Show Decrease in Mileage

Traffic experts of the railroads themselves are giving deep thought to the availability of the motor truck in supplementing their present facilities. The present shortage of both track mileage and of freight cars makes the subject a most pressing one for the railroads and a most encouraging one for those interested in the automotive branch of transportation.

According to figures from the Interstate Commerce Commission, the total single track mileage of the United States, January 1, 1918, was 253,626 miles and statistics show that the railroad mileage in this country has decreased instead of increased. Last year 689 miles of line were abandoned. This exceeds by three miles the mileage of new lines built during the year. Furthermore, 1919 was the third year in succession in which reports have shown the mileage abandoned to have exceeded the mileage of new lines built. During the three years from 1917 to 1919 inclusive, operation was abandoned on 3319 miles of line and in the same period only 2386 miles in extensions, branches and new lines were completed and placed in service. Thus during this period, there has been an actual decrease of 933 miles in the mileage of railroads in the United States. It is interesting to note that this tendency to decrease railroad mileage is shown in all three railroad districts — eastern, southern and western.

This article deals with the importance of making highway transport surveys. The number of failures recorded in the highway transport field are due chiefly to the lack of properly made surveys or an analysis of the territory to be served.

These figures are taken from "Railway Age," an authority on steam railroad construction and operation. This authority is also responsible for the statement that the greatest freight car surplus ever recorded on the American railroads occured in March, 1919, when there were 450,000 cars idle, that today there is a shortage of 570,000 cars, that the railroads are, at present, unable to handle all the traffic that is offered to them and that while the present traffic is unusually heavy, further increase can be expected within the next few years. Records of past performances indicate that the future business cannot be handled without serious shortages of equipment unless a great many additional cars are acquired.

In addition to this tremendous freight car shortage there is also a great shortage in motive power. It is estimated that nearly 8000 units of 60,000 lb. average tractive effort should be built during the next three years to take care of freight traffic alone.

This great shortage of freight cars and motive power and the insufficiency of terminal facilities, in the face of increased traffic, indicates that the motor truck and the highway must be more extensively used than at present if the business of the Nation is to be kept moving properly. That it shall be kept moving is absolutely necessary to the life of business and its continued growth.

If we compare, for a moment, the total highway mileage in the country with the railroad mileage which is as ten to one, and if we also consider the flexibility of the motor truck as against rail operation and that one method of transport is quite as dependable as the other, we can begin to realize the work that highway transport should be made to do.

In this connection it is also interesting to note that the freight car makes an average of but fifteen miles a day and that the average tons per loaded car is less than 28. **From this we can get an even better picture of how the motor truck can greatly assist the railroads in moving the traffic of the country.**

I don't believe that the motor truck should compete with the railroads, as a general proposition, but I do believe that they should be operated when it can be shown that it is more economical for such operation to take place. By economic I mean where the motor truck, as compared with the railroad, can cut down the time of delivery make such delivery more frequently and at less cost.

When we realize the number of absolute business geniuses who have devoted their lives to railroad transportation problems, and then realize the extent to which highway transport can be employed to supplement and extend the usefulness of these same lines, we have a prospect before us broad enough to satisfy the most ambitious and those with the highest ideals.

After the steam railroads, in considering the motor truck as an aid to existing means of transportation, a highway transport survey would concern itself with the relation of highway transport to electric railway service.

Electric Railways in Chaotic State

The electric railway situation in the cities and suburban and rural districts of this country is in a very chaotic condition. Many lines have been abandoned; others thrown into the hands of receivers, fares raised and service curtailed—all to the great disadvantage of the traveling public. I am quite sure that local surveys would frequently indicate that

(*Continued on page 106*)

* Extracts of address delivered before recent annual convention of National Highway Traffic Association.

Opportunity in the Automotive Trade With Russia

By PROFESSOR NICHOLAS KOUSNETZOFF

ALTHOUGH torn to pieces by the greatest civil war history ever saw, Russia nevertheless is in better condition as to the reconstruction and re-establishing of her normal life after this war than the United States was after her Civil War. And if the United States could resume her peaceful life very rapidly, suffering Russia will do the same in even shorter time and will again resume her right place among the great powers.

However scarce and incomplete the information is that we have from Russia about her present state of things, one can see that she is already emerging from the havoc of the great war; the red flames of the revolution and the madness of the civil war that lately convulsed her.

Russia is still in disorder, and, therefore, is perhaps lacking the most important things, but we must consider that the abnormal state of affairs in Russia is nearing its end, while in all other European countries the same is only beginning.

Russia has already outlived the most critical and hardest period of her crisis. The day is coming, when the blockade will be lifted and the normal relations between Russian and the outer world will be resumed.

American Prospects Big

The richest Russian market will be opened and American industry must come among the first to this vast country; especially the automotive products, owing to the greatest demand for all means of transportation.

Russia has the area of 8,600,000 sq. miles, in other words, about one-sixth of the whole earth's surface, and her railroad system presents only some 46,000 miles — one-tenth of the mileage that is in the United States. Even this wholly insufficient net of railroads in Russia never works at its full capacity and the whole system is lacking in adequate organization. When Russian railroads were built all attention was paid to the strategical ways and to the principal trunk lines, while the commercial interests and auxiliary lines were badly neglected.

The result of this was that several lines crossing the richest part of the country were working at deficit owing to the lack of freights and in the same time the goods were wasted quite close to the trunk lines because of the poor means of transportation to the railway stations.

In several cases the railway passed the cities at a distance of many miles, and certainly those cities could never develop and become prosperous. The building of the numerous feeder lines which would enable the country people to bring their products to the trunk lines without transshipping is one of the first aims of the government but it will require quite a long time to be accomplished, maybe 10 or 15 years, and in the meantime some other way must be found to relieve this unbearable position created by the long unrest.

Trucks to Solve Problem

It is easy to see that the best solution of this important question is to utilize trucks on an extensive scale.

Instead of building new feeder lines, which would be very expensive and require years to be executed, the existing dirt and macadamized roads can be easily improved so as to allow motor trucks to transport all goods from the adjacent boroughs and villages to the stations.



Showing Most Important Russian Highways

The roads already existing somewhere are good enough to be used even without improvement, but the greatest part of them are in very poor shape and require almost complete reconstruction. The experience of latest years shows that the motor trucks can perfectly well run on the ordinary railroad tracks when their wheels are changed accordingly, and as the number of engines in Russia now is very scarce, and the need for traffic is too great, motor trucks can be widely used for this purpose, considering that the same trucks will afterwards be able to make their regular service on the roads with rubber tired wheels; no other change in the mechanism being necessary.

Therefore we see that the motor trucks will relieve the hard position of Russian railroads and the need for them will be extremely great. Motor trucks of all description, all capacities and power can be used, according to the local conditions, and the amount needed by Russia can hardly be estimated now.

However great this market for the use of motor trucks on the railroad tracks, certainly the use of them on the ordinary road will be tenfold larger and this fact must be examined more carefully.

Germany always feared America as the most powerful competitor for her industry and she did her best to spread in the public the erroneous and unfavorable opinion that Russian roads are not good for motor cars and trucks. It was done to prevent American dealers going into Russia with their products. In reality Russia has more than 400,000 miles of dirt roads, which are unimproved, but fairly good during the dry season, being almost impracticable during the rest of the year even for the light horse carriages. The amount of improved and macadamized roads is very insignificant for such an enormous and rich country, but quite excusable owing to the scarcity of motor cars.

Roads Neglected for Railroads

The main reason for it is the fact that while all European countries considered the building of the macadams as their first duty, in Russia the government paid all its attention to the construction of the railroads and the macadams were completely neglected.

To illustrate this with figures we can mention that during the last 50 years no improved road was built in Russia and for the existing macadams a paltry sum of $6,000,000 was spent yearly; and out of this sum $4,000,000 were appropriated for the strategical roads in the southwestern Russia and the remainder for improving, mending and maintaining all existing macadamized roads.

In European Russia we can estimate now the total number of roads known as "Chaussées" as about 25,000 miles, binding the largest cities only, without branches.

The accompanying map shows the most important of these ways. One can see that motoring through Russia is quite a possible thing and there is no danger of going astray, because the macadamized

(*Continued on page 96*)

Sales Suggestions and Ideas That Are Making Money for Some Dealers

A BOSTON dealer has evolved a practical plan for checking up the prospect list. Each salesman is requested to file five names and addresses of what he considers the best live prospects with the sales manager. This is done weekly. The sales manager uses the lists as a tickler and whenever the name of one of these prospects disappears from the list the salesman is asked for an explanation. It may be that the salesman has not the right temperament to sell the prospect or has failed to convince the prospect of the utility and profit of a truck. If such be the case another salesman is assigned the prospect and the first salesman supplies the second all the information he possesses. The plan has another advantage in that it deters the salesmen faking a list of prospects.

Service Man to Act as Scout

A St. Johnsbury, Vt., dealer, who has a very large territory, handling both trucks and passenger cars, in discussing service for trucks in his territory, which includes many isolated places, said he proposed to try out a new service plan. His idea is to send a mechanic from his service station to travel the territory and call on the owners of trucks and passenger cars. This mechanic is to make adjustments and a thorough inspection of the car, reporting on same to the office. The mechanic is to talk with the owners, obtaining their ideas as well as criticisms. The man will also study local conditions and check up the service supplied by the sub-dealers or agents, noting the condition of the repair shop, salesroom, parts carried, etc. The mechanic then reports. In discussing the plan the distributor said: "Primarily the mechanic will be in the territory aiding the owner and the dealer but his method of investigation will not be one to make the dealer think he is being checked up. Being a mechanic my man will be able to extract much valuable information from the men in the repair shop, as to parts giving trouble, etc. He will also keep his eyes and ears open for leads for trucks and passenger cars. Later it is planned to follow up with salesmen."

In discussing the problem of giving service to the truck in isolated territory this dealer said he believed the solution of the problem was to have the distributor cover a radius of 50 miles, to have owners send in their trucks for repairs and overhauling. The sub-dealers and those in isolated places could be cared for by promptly supplying them parts and by sending a mechanic to do the work if necessary. "These small dealers cannot afford to stock adequate parts," said this dealer, "nor can they carry a high grade salesman for the overhead would eat up all of the profits. Several have tried it but found the long winters too much for them. These dealers must be helped by the distributor and educated to the possibilities of developing sales in their territory."

This Dealer Suggests Better Contracts

There is a dealer in Burlington, Vt., and a successful one too, who merchandises both trucks and passenger cars. The writer spent part of an afternoon discussing sales and service with this dealer and among the subjects talked of by the dealer was that of contracts. "Why is it," said he, "that some manufacturers after signing up with a dealer are so careless as to permit letters soliciting an agency reaching the dealer?" And he showed the writer a letter from the company the dealer represented. "Now this is not the first letter I have received. It has occurred months after I had been selling cars. I am too old in the business not to know the whyfor but can you imagine the effect such letters have on a new dealer who is making his plunge in the automobile industry?

"Isn't it logical for the new dealer receiving such a letter to assume that he is not making good, that the factory contemplates making a change? Of course some will take the matter up with the factory and learn of the actual conditions but there are many who will not. And the effect on a young dealer struggling against odds is discouraging to say the least."

"Speaking of the contract," continued the dealer, "I am strong for a 99-year one but with a 60-day cancellation clause. My reason for this is that it would tend to make the factory and distributors more careful in appointing representatives. The latter are, perhaps, the greatest offenders in this respect for they will give an agency to anyone. What is the result? It is that these hastily appointed dealers do not carry any parts, give any service and sell at any price. The cut price method creates the impression among business men that all truck dealers cut more or less and bargaining results. It's these conditions which develop the gyp.

"While I am at it I might as well unload some more. I criticise factory heads for not having a more personal contact with the dealers. Of course I know they are busy men and the country is large but if they would send reliable men to investigate conditions, advise the new dealer and aid him I believe many of the problems would be solved. I know of dealers in my territory who were appointed by the New England distributor who has never visited his representatives. Occasionally he sends an 'office boy' around. What happens? The boss looks over his records and finds Bill Smith in Bugleville has sold but one truck or two in six months. There is an application of Bill Brown in the same territory. Brown may have more money or write a more business-like letter than Smith. And the 'office boy' may not like Smith, so he will boost for Brown. And Brown gets the territory. Now I argue that this is wrong. If the distributor or a capable wholesale man of the distributor would drop in on Smith he might find why Smith was not doing so well. It might be that Smith needed help, aid, that should be extended by the distributor. These small chaps need lots of help, barrels of it. You can't develop the small chap into a transportation expert in a few weeks nor by a correspondence school course. What we need in our territory is more factory supervision, more checking up by broad minded experienced men who will not be influenced by the human equation."

Trading Tombstone for Truck

The writer has heard of rather odd trades being made by truck dealers. It is recorded that some accept horses, wagons, pianos, phonographs, etc., as part payment for a new truck but the prize goes to a Buffalo dealer who tells the story himself. It appears that one of his salesmen dug up a prospect in the shape of a monumental concern and reported that the prospect would take the truck at the list price but insisted that the dealer take a tombstone at list price. "Did I do it?" said the dealer. "I did because the prospect sold me on the idea that eventually I would die and that I would need a stone. But I cannot be sold again on the same idea."

A New York City dealer has worked out a plan whereby the time of the salesman is conserved in circularizing prospects, of following up with literature. After a salesman calls on a prospect and does not close the latter is sent the conventional literature and follow-up letters. The manufacturer of the truck publishes leaflets showing the use of trucks in various industries and if the prospect is a coal dealer, for example, matter dealing with the use of trucks in this industry is mailed. The general practice is for the salesman to pick out the literature and either address it personally or have the office mail it. The New York dealer lists all circulars, letters, etc., under a number and the lists are indexed. When a salesman desires matter sent a prospect he makes out a slip with the numbers and the order to be sent. This is passed over to a girl who selects the literature from the stock room and mails it. This literature is kept on shelves which are numbered and the numbers correspond with the salesmen's list. As new literature is added it is numbered and indexed. This saves the salesmen's time and the literature is more efficiently handled. Service letters and bulletins are similarly handled.

Tommy Williams Shows How the Time Factor in Service and Obtaining Replacements and Equipment Can be Cut in Two

He May be a Small-Town Truck Dealer, But His Service Manager Puts One Over on the Big Distributor. Simple Method of Taking the Kicks Out of the Kickers

By C. P. SHATTUCK

J. G. WILKINS, head of the Pawtucket Motor Truck Company, was back at his desk after a week at the shows in the big city. And J. G. was glad the annual events were over, for his nerves were a little frazzled—it had been a very strenuous week. Hawkins, the tireless sales manager of the Pawtucket factory had seen to it that there were few idle moments for J. G., and Hawkins was credited as being some entertainer. The 18th amendment hadn't slowed up Hawkin's speed any, thought J. G.

J. G. was busy with the reports of the various departments when Myrtle Brown, his secretary, announced Tommy Williams, former star salesman of the company and who was now in business for himself selling Providence trucks. Tommy was accompanied by his service manager and head mechanic, Jimmy Myers. Both were heartily welcomed, Tommy particularly, for J. G. was enacting the role of godfather to his former employee.

"Excuse me a moment, Tommy, until I clean up this mail—just a few personal letters," said J. G. as he pushed over the humidor. J. G. opened one letter, read it and let out a growl. The next letter fed the fire of J. G.'s wrath and the third created an explosion.

Somebody's in for it, thought Tommy. He was entirely familiar with the danger signals, for had he not been associated with the company for several years?

To Tommy's surprise J. G. passed the letters over to him with the remark, "That's what happens when the old man takes a few days off. Read them, Tommy, and profit thereby," and J. G. punched the signal buttons summoning the heads of several departments. Tommy started to take his leave, but J. G. waved him back to his seat. "Stick around, Tommy," he said. "You will get some points from these interviews."

Kick No. 1

The head of the tractor department was on the carpet. "Mr. Roberts," remarked J. G., "I have a letter here from Henry Jones up in ———. You sold him a tractor last spring. Listen to the flattering remarks he makes about our tractor service."

'Mr. Wilkins: When I bought this tractor from you, your man said if anything ever busted it would be fixed quick. The jigger on the mag that makes the engine start is busted and I can't start her without it. Starts hard anyhow. Telephoned and you man came up and took off mag. That's a week ago and mag isn't back yet. Called up and he said he had sent it to the factory. Course I am not plowing snow, but was sawing wood when the thing busted. If I remember rightly, your man made a big noise about service. I say it's rotten. Will you swap the tractor for a horse? I hear you own a couple on your farm.'

"Some service, Roberts, what?" remarked J. G. "What's the reason?"

"Why, Mr. Wilkins, the impulse starter's spring broke and we had to send to the factory. Didn't have any in stock, nor an exra mag. Tried a truck mag, but that old rube couldn't start his engine on it. Couldn't spin her. Have written factory about it and they say it was shipped last week but you know how the storms have tied up everyhing. I'll chase up the express company and 'phone that rube right away. No, we did not have a tractor in stock to get a mag from. Tried everyway. Sorry, sir, but guess we ought to stock more parts. Was waiting for you to come back to take the matter up."

J. G. dismissed the speaker with the remark that he would take the matter up latter.

Kick No. 2

Bill-Smith, head of the used-truck department, was the next victim. "Mr. Smith," said J. G. "I have here a letter from a purchaser of one of our used trucks that is highly complimentary to your department," and J. G. actually smiled. "It says: 'When I was in the market for a truck your salesman interested me in a traded-in car as I did not care to invest in a new one. I was assured that the truck was in good condition and your Mr. Smith said he could supply parts for it and give just as good service as with a new one; in fact, he impressed me with the fact that service was the slogan of the company. I want to congratulate your company on its service. When a bearing on the magneto refused to bear any longer, and when a spring refused to spring, only then did I learn the meaning of the word service. What will you give me for the old mess of junk you loaded on me?'"

"A fine testimonial," acidly remarked J. G. "It is so good I suggest that we have copies printed and use them for advertising. Well, let's hear the excuses."

"Oh, that bird has no real kick coming. It's an old truck. He ought to have bought a new one for his work, and I told him so. The mag bearing was all right if he kept it oiled, but I guess he used emery. As to the spring, that bird stuck on about five extra tons on an old truck and the spring just got tired and quit, that's all. Could fix him up on the mag, all right, but had to send to the truck factory for a new spring, as there is no dealer handling that old ark within a hundred miles. Spring ought to be here any day. That bird's unreasonable. You can't argue with him. Thinks we carry extra parts around in our pockets. Never told him we stocked parts on that old ark, but said we could get them. And we will—sometime."

"I see you know who the party is," remarked J. G. "I'll take this matter up later with you Mr. Smith."

Kick No. 3

The head of the equipment department was next on the carpet. To him J. G. read a complaint from a user of Pawtucket trucks to the effect that a certain make of traction device had been ordered and it had not been delivered as promptly as it should. "How about it?" asked J. G.

"The order was for a make we do not stock, but the customer insisted on it, so we said we would order it as the local jobber did not stock that make. There was a slight delay, but the customer has the equipment now," was the explanation.

"Try to sell him the line we carry?"

"Yes, but he said he wanted what he wanted. You know how obstinate Mr. X is." J. G. did. He recalled how this man insisted on a different make of carburetor when he bought his truck and one which simply eats up the gas on the Pawtucket engine. Later the customer changed back.

Dismissing the equipment department head J. G. turned to Tommy and remarked Tommy, "and I am surprised that not new, but it simply shows some of the problems we are up against in the truck business in trying to give service. It's the human equation again. We were at fault on that tractor kick and the worst of it is that farmer up there will spread the news. As to the trade-in owner's kick, Smith is not wholly to blame, but he lacks diplomacy in handling kickers. But this owner feels that he has a real kick coming on service. As to the last complaint, that is a question of merchandising."

"I don't agree with you, J. G.," remarked Tommy," and I am surprised that your department heads don't know how

to cut in two the time required to get parts, how to give service in such cases."

"I suppose you do, Tommy?" sarcastically. "Learned the business so quick?"

Tommy grinned. He knew the old man's moods and nothing he could say would be resented, for had not J. G. piloted Tommy through the quicksands of merchandising trucks? "Tell you what, J. G.," said Tommy, "I'll wager my service man here can show you how those parts could have been obtained in half the time and given your kickers some service, and—"

"Make a dinner for three," snapped J. G. "That will let you down easy."

"You're on, but to show you that our system will apply generally, I'll let you add five or six more similar problems to the complaints and if Myers can't show you 70 per cent. results, I'll pay for the dinners and the cigars thrown in," and Tommy winked at his service head and grinned.

J. G. set the wheels in motion and the reports from the various heads showed delays caused by the following:

1, 2, 3. Complaints described.
*4—Hubodometer returned to maker for adjustment. One week.
*5—Starter at maker's for new ball bearing. Ten days.
*6—Lighting generator on truck, ditton. One week.
†7—Special fan belt for passenger car. 5 days.
†8—Order for new jack. 6 days.
*9—Special battery ignition equipment. One week.
‡10—Special oil lamp for old truck. One week.

"All set?" remarked Tommy. "All right. Let's go. Tell him the story Myers." This is the way Myers told it.

"Take the matter of that impulse starter, Mr. Wilkins. That is made by the same company as makes the mag. They haven't any service station here, but they have one less than 50 miles from here, where your man could have got the part in less than a day by going after it. Now wait a minute. Your man probably doesn't know it. I'll prove my statements when I get through. As to the broken spring the maker of that spring has distributors and service stations scattered around the country, but your man probably thought of the narest factory branch which is some ways off. There is a service station in the same city as the impulse starter. And as to the ball bearing for that old mag, and those for the generator and starter, why there were two ways it could have been done. One was to get service from the nearest service station of the maker of the bearings or from the maker of the units. Both are not over 75 miles off. The same will apply to the ignition stuff wanted.

"As to the special orders. All jobbers do not carry the fan belt wanted or the lamp. But the maker of that belt lists lots of places, and one neaby you, where it could be ordered and gotten quick. Same with the lamp. Your man could not identify it, but he could have taken that maker's illustrations, got the name and shot in an order by wire and had it here in no time. I guess that's all."

"Not so fast," snapped J. G. "You assume that my heads do not know of whereof you speak. They have all circulars, lists, catalogues, etc. Must be something wrong here."

*—No local service station or factory branch.
†—Not stocked by local jobbers.
‡—Owner insisted on lamp being obtained.

J. G. Began to Listen Attentively

"Not so. You se we service men and mechanics do not get half of the stuff shot out by the manufacturers. Lots of the good stuff goes in the waste basket. Never reaches us. And before I came in and had a talk with your heads on these matters. Am picking up points, you know. Tommy wants me to do it. Said you had a fine place here and a great system. They didn't have the dope at all, but they have now, because I gave it to them."

J. G. sat up and took notice, and Tommy grinned, for he had the old man stuck for the dinners. But J. G. had to be shown and Myers showed him.

"Just get down that book hanging on that hook, Mr. Wilkins," said Myers, "and as I call off the numbers look for the pages." J. G. did. The first numbers were pages 444 and 447, and J. G. found that two magneto manufacturers not only gave the list of their service stations but the street address. As Myers said one was within 50 miles.

"That takes care of the impulse starter," remarked Tommy. Turning to page 72 and 73, J. G. found similar conditions obtaining as to bearings, and pages 381, 382 and 383 showed the service and parts stations of maker of the special ignition equipment wanted. Page 638 revealed the spring maker's list of parts station, one within a reasonable distance, and page 465 informed J. G. that the maker of the hubodometer had a service station not less than an hour's drive.

"I guess I lose," said J. G., "but what about that special fan belt, jack and the lamp?"

"Easy," was the reply. "Turn to page 99 and there is a list of all cars for which that belt is made. Page 395 will tell you the story about the jack and, as for the lamp, why a duplicate of it is illustrated by its maker on page 405. No, there's nothing wonderful about this, Mr. Wilkins. You see, we are up in the woods where we haven't a service station for batteries, ignition, springs, odometers, etc., and we aim to give service on our trucks as well are cars and tractors for you know we have a lot of farmer trade and they do not boost for you when you fail to make good. And another thing. There are service stations for lots of the things we use in our business, but in the average city you will find that they are not listed in the directory or telephone book under the parts name. By that I mean Brown & Smith will be distributors or service representatives for a certain magneto, but are listed under their name. That's what puzzles us small chaps away from the big places."

"By the way, Mr. Wilkins, here's an announcement that reached me yesterday and that will interest your service department, for it means that it will cut the time used in repairs and servicing in two, if not better as well as greatly improve service for us all," and Myers called attention to the following paragraph which read:

"Commencing with the April issue, there will be a section devoted to the every-day needs of the repairman. Included in it will be such valuable data as the following:

Table covering sizes of ball and roller bearings used in cars and trucks.

Equivalent table of annular ball bearing sizes.

Storage battery replacement table for 1918 and 1919, showing voltages, ampere hours, model, maker's name, etc.

Table of lamp candlepower and voltage, single or double contact base.

Hose replacement table giving sizes and lengths.

Brake lining table for al cars and trucks, giving length, width and thickness.

Spark plug sizes for all models.

Carburetor table giving make, size, and type of outlet.

Piston ring sizes for all makes of trucks and cars.

Serial numbers of cars and trucks.

List of trade associations.

Where to get parts for orphan cars."

The book referred to by Myers was the CHILTON AUTOMOBILE TRADE DIRECTORY. J. G. riffled the pages and remarked, "You win, Tommy. Let's eat."

Council of National Defense Urges Standardized Traffic Regulations

The urgent need for uniformity in regulations and directions having to do with the control of traffic in cities is finding expression in legislation now pending before the United States Senate. Endorsements coming to the U. S. Council of National Defense in response to its many inquiries are interesting and illuminating in respect of the interest felt in this movement. The outstanding feature of these comments is the need for such uniformity that not only local traffic may be effectively regulated, but inter-city and inter-state traffic as well.

Good results are reported from over the country in connection with campaigns, both of a local and national character, to reduce the number of traffic accidents, this improvement being noticeable in Washington, where intensive study is being given to this subject to the end that improvement there may furnish an object lesson for cities throughout the country.

Potter Motor Equipment Co., Columbus, Ohio, was recently incorporated with a capital stock of $30,000. This company intends to take over the sale of accessories, parts, oils and gasolines. The incorporators were L. L. Potter, M. A. Potter, I. M. Potter and Eugene Lippincott.



SERVICE AND REPAIR DEPARTMENTS



Recommended Practice for Testing and Locating Trouble in Berling Magneto, Type E-41

By C. P. SHATTUCK

THE following methods are those utilized by the service department of the Ericsson Manufacturing Company, Buffalo, N. Y., for testing and locating the cause of trouble with the type E-41 four-cylinder independent Berling magneto. The instructions given herein, and which are illustrated, do not comprise all tests made at the Berling factory or its officially appointed service stations, but directions for work that may be accomplished by the mechanics of the truck dealer's service station having a practical knowledge of a high-tension magneto. If after complying with the directions outlined the magneto fails to deliver the proper spark, it should be returned to the nearest service station or to the factory, for expert knowledge and special tools are required to disassemble magneto, and such work should never be attempted by other than a factory service station.

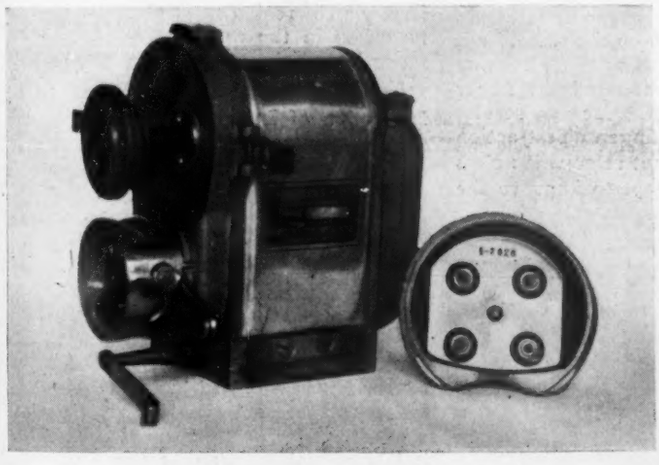
Removing Magneto From Engine

Assuming that the magneto is to be removed from the engine. **Disconnect wire from the switch** at the terminal of the cam housing **and the spark plug cables from the terminals of the distributor block. Disconnect coupling** connecting armature shaft of magneto and driving shaft of engine, but leave driven section of coupling—that attached to the magneto—as it is needed to test spark.

If magneto is of variable type; that is, the cam housing can be turned to advance and retard the spark, **disconnect control linkage from lever of cam housing. Unbolt magneto from its base.** Place magneto on the work bench and clean exterior with cloth moistened with gasoline. Remove all dirt and grease and wipe dry. **Do not use a brush or squirt gasoline on magneto when cleaning.**

Cleanliness Essential to Success

Work on a magneto should not be attempted with dirty or greasy hands, nor should the instrument be placed on a dirty bench. Place a piece of clean paper on the bench, for it should be borne in mind that dirt is an active abrasive, and wear of parts moving at high speeds will result if parts are replaced other than in a perfectly clean condition.



Showing Distributor Block With Brushes Removed

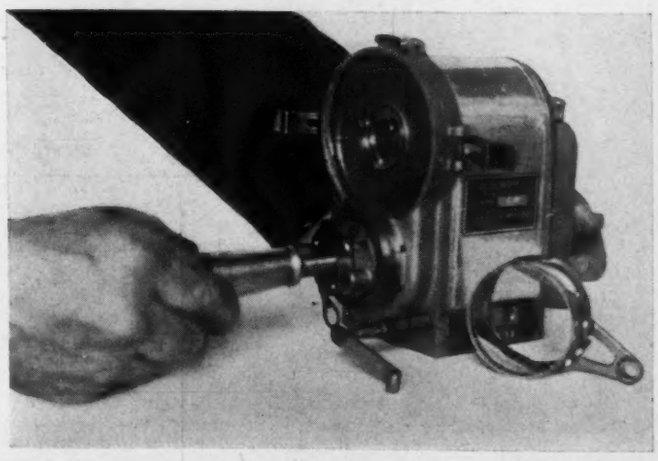
Also cam housing cover displaced and distributor finger assembly pulled forward in direction of removal.

But few tools are required for the work. They comprise the interrupter contact adjusting wrench with gauge attached, and two wooden or insulated-handled screw drivers. The latter should be an 8-in. with a well ground 5-16-in. blade, and a 6-in. with 3-16 in. blade. In addition there will be needed a straight socket wrench with a 5-16-in. socket. The latter should preferably be mounted in a handle as shown in an accompanying illustration.

To **remove cam housing cover** slip the spring-like clamp to one side and lift off cover. Clean with cloth moistened with gasoline and lay to one side. **Turn armature shaft** in the direction of the arrow on the driving end bearing assembly **until the interrupter lever rests or bears exactly in the center of the recess or depression of either of the two cams** in the cam housing. An accompanying illustration shows the correct location of the lever to the cam. This fully separates the interrupter contact points. **Insert feeler gauge** attached to wrench. If the space or gap be correct the gauge will fit snugly. If not, the space is too large and will need readjustment.

Cleaning Contact Points

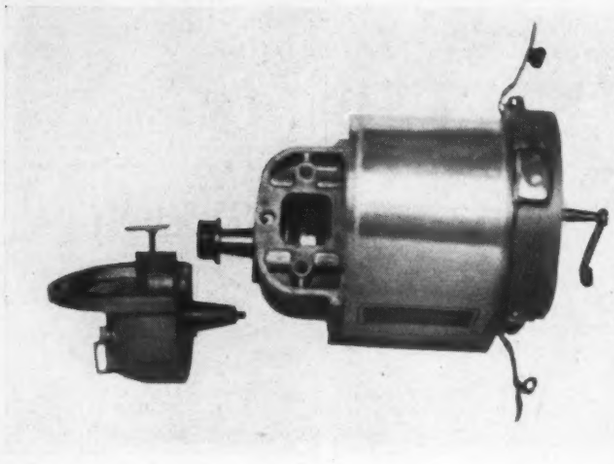
Careful examination should be made of the contact points, and if dirty they should be cleaned. Cut a strip of 00 sandpaper about 2 in. long and about ¼ in. wide. **Slip off cam housing** by pull-



How the Socket Wrench is Used to Remove Interrupter Mounting Screw

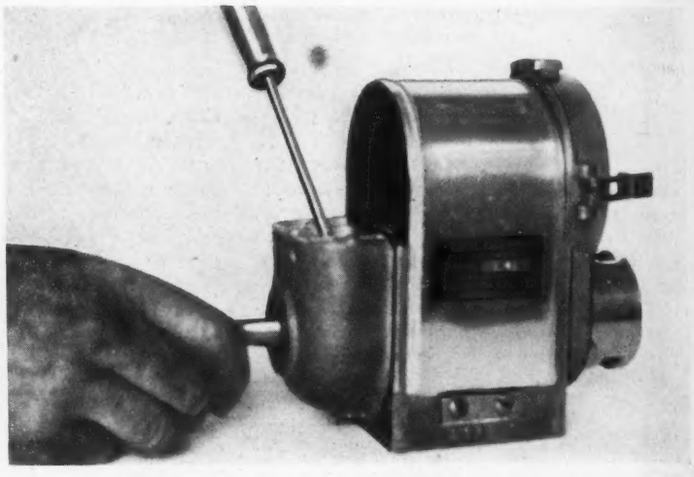
The coupling end of armature shaft is held in left hand to prevent it from turning.

ing it forward. Place ball of thumb of the right hand on the interrupter lever and index finger of same hand on round projection on the interrupter disc or base and as shown in the accompanying illustration. Press on interrupter lever with thumb, which will **fully separate contact points.** Place strip of sandpaper between thumb and index finger of left hand and insert paper between the platinum contact points. Relax thumb pressure and allow points to grip the sandpaper and move paper back and forth, always keeping paper in the same plane as the surface of the points. Use a fresh strip of sandpaper, but reverse the side of the abrasive so that the other contact point will be cleaned. Care must be exercised not to remove too much of the platinum. Ordinarily a stroke or two of the paper will be sufficient to clean the points. **The interrupter mechanism must be thoroughly cleaned** after this work, but this is not done until distributor is cleaned.



How to Get at the Collector Spool

The driving end bearing assembly with half of safety spark gap, and brush holder assembly is removed as a unit to afford access to the collector spool.



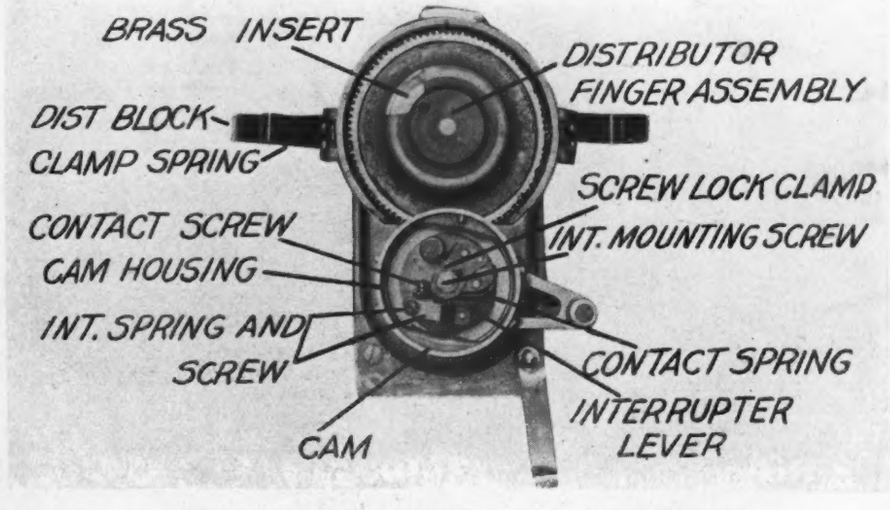
To Test Spark Point

Screwdriver blade is held within ⅛-in. of collector spool and armature turned briskly. Blade of tool is held against housing.

Removing Distributor Block Assembly

Remove the distributor block assembly by pushing outward on the two clamps, and displace the distributor block. This will expose the distributor finger assembly having a brass insert, which contacts with and carries the high-tension current to the brushes in the distributor block. This **finger assembly** rotates with the distributor gear and **can be removed by pulling it out straight.** It carries a brush at the small end.

Examine carefully the surface of the brass insert, and if burned or worn it should be resurfaced. This is accomplished by placing the stem of the finger in a lathe and refacing the surface. As the finger can be easily crushed care must be taken not to set up the chuck drill too tight, else the finger will be split. The surface must be turned true. If not equipped for and familiar with turning such work it is best to send the finger assembly to the nearest factory service station or use a new finger. Test action of the brush, but do not remove it unless broken. Do not attempt to improve the tension of the brush spring. In replacing an old brush with a new start first coil up the spring in the opening by compressing it and impart a turning motion. **Clean finger assembly with cloth moistened with gasoline and wipe thoroughly dry before replacing.**



Distributor Cover and Breaker Box Cover Removed

Showing interrupter lever resting in center of cam and contact points fully separated, also distributor finger assembly with brass insert

Displacing Interrupter Assembly

If it should be necessary to replace an interrupter assembly with new because of damage, etc., grasp the coupling on the armature shaft (driving end) with the left hand and hold it firmly to prevent shaft turning. The interrupter screw is prevented from moving by a screw lock clamp. **Pull out on screw lock clamp until it clears screw head and slip to one side. Attach socket wrench to screw head** as shown in the accompanying illustration. The interrupter screw has a right hand thread. **Remove the screw** with the socket wrench. The interrupter base is of brass and has a key which registers with a key way broached in the armature head. To **remove base** if it sticks, tap its edges with a strip of hard wood. Tap lightly.

Inspection of Interrupter Ground Brush

Removal of the interrupter base is essential to examine the ground brush in the rear of the base. This brush should make a good contact with the surface with which it contacts, and the surface should be clean or highly polished. **Test action of brush in holder and clean contact surface** mentioned with a cloth moistened with gasoline **and wipe dry.**

Inasmuch as the high-tension or induced current is collected from the windings of the armature by a brush in contact with the collector spool on the armature, it is essential to examine the brush and clean the spool. **Loosen mounting screws in driving and bearing assembly** at rear of magneto and **lift off assembly.**

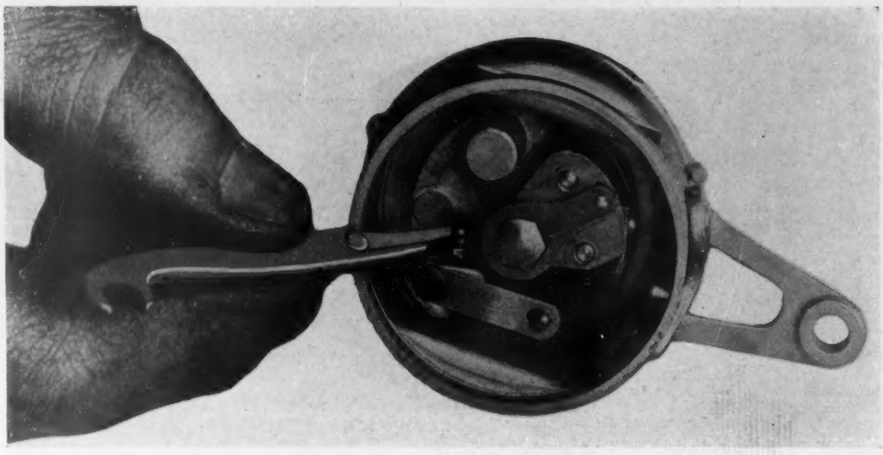
Note—It is only necessary to loosen the screws in the driving and bearing assembly. They should not be removed from the unit.

The driving end bearing assembly includes the brush holder assembly and one section of the safety spark gap. **To remove the driving end assembly,** tip it forward and at an angle so that the safety gap member will clear the magnets. This should be done slowly and

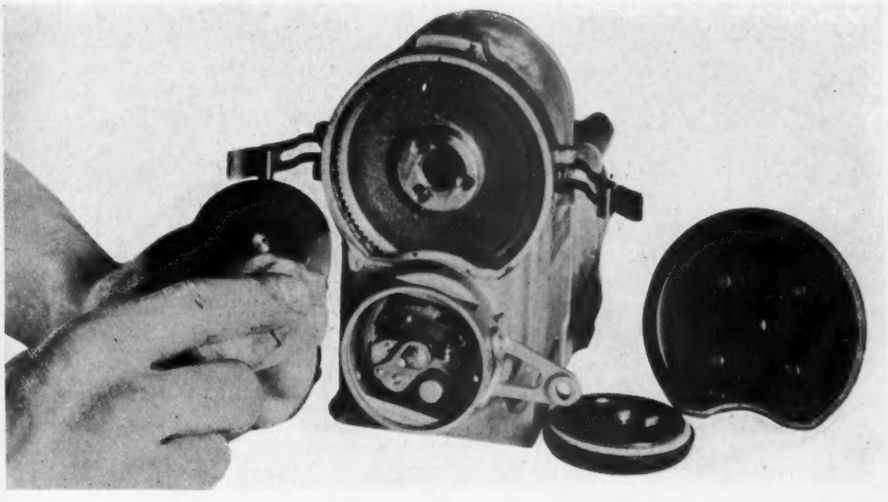
carefully, so as not to injure the safety gap. Examine and **test action of brush.** Examine collector spool for carbon dust. Take a piece of cloth moistened with gasoline and hold it against the spool and rotate the armature slowly. Clean and wipe dry. If metal of spool is badly worn send the magneto to the nearest factory appointed service station or to the factory. Removal of the armature should not be attempted, for its replacement requires factory training.

Replacing Interrupter Assembly

Before replacing the interrupter base or assembly clean all parts carefully, especially if the contact points have been cleaned with sandpaper. Remove all foreign particles and wipe with cloth slightly moistened with gasoline. **Never dip the assembly into gasoline nor squirt gasoline or kerosene in the assembly, the collector spool, distributor, etc.,** as this will breed trouble. If the driver of the truck has attempted to clean the contact points with a file or filed them out of true and removed practically all of the platinum, send the interrupter assembly to the factory or service station or replace with a new one. One of the contact points is attached to a spring-like member, and to remove, replace and adjust requires a special tool that is only supplied by the factory to its service stations.



Illustrating Proper Use of Gauge in Determining Gap of Contact Points



Showing the Distributor Finger Assembly Removed and How It is Cleaned with Cloth Moistened with Gasoline

Wear of Interrupter Lever

When a magneto has been in service for a long time, the interrupter lever, which is constructed of a special fibre, may be found to be worn. If so, it should be replaced with a new one. The wear is frequently due to allowing dirt to collect in the interrupter assembly by running with the cover displaced and through neglect. The interrupter lever is pivotally mounted on a pin or stud and is retained in place by a steel spring secured to the disc or base by a screw. **To remove interrupter lever, loosen screw in spring and slip spring to one side.** The interrupter lever contains a small coiled brass spring which keeps the contact between the platinum spring and the lever itself constant, and when installing new lever care should be taken to see that this spring is in its opening in the fibre lever and bears properly on the platinum spring. **Replace spring and tighten screw.**

Adjusting Contact Points

If a new lever is installed it will be essential to adjust the contact points. This is a simple operation, as the fixed contact is carried in a slotted stud and locked by a screw. **To adjust, loosen lock screw and turn contact screw with the wrench** accompanying the gauge. Always use gauge in setting the points, and after locking screw use the gauge again to make sure that the gap is correct. Before adjusting the contact, however, it will be essential to replace the interrupter assembly. See that key registers with keyway in replacing. The key is not for the purpose of driving the interrupter mechanism, but simply as a locking feature for placing the interrupter assembly on the armature head. As the key registers in the keyway the interrupter screw should be securely tightened down and the lock clamp replaced over its head. **Replace cam housing.** Next **adjust contact points** as previously described. **Re-**



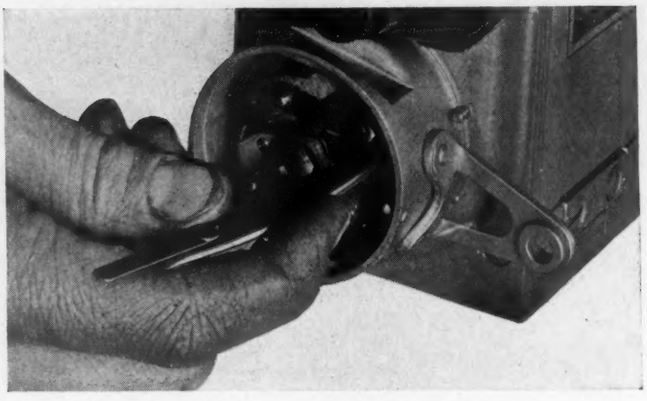
The Interrupter Base Has a Key, Armature Head and a Keyway Broached in It

Base is retained by hexagon mounting screw

place distributor finger assembly. It can only be replaced correctly. If not there will be space between it and the distributor gear.

Testing for Spark

A test may be made of the armature, for spark, but this must be done before the driving end bearing assembly is replaced. Place cam housing in a fully advanced position. Grasp coupling of armature shaft with the right hand and place metal blade of large screw driver on metal of housing and hold top of blade not over ⅛ in. from metal of collector spool. Rotate armature briskly and a spark should bridge the gap between tip of screw driver blade and the metal of spool. Always use a wooden handled screw driver or one installed in making this test and be careful not to touch the metal with the fingers, else a shock will be experienced. **Replace driving and bearing assembly. Clean distributor block with cloth** moistened with gasoline and wipe dry. See that carbon brushes are intact.



Placing Interrupter Lever on Upper Cam as Shown Will Bring Contact Screw Into a More Favorable Location for Adjustment

Lubricating Suggestions

Test action of the contact points by turning armature shaft slowly, and see that the spring member moves freely. That part of the spring contacting with the interrupter lever or block must be clean, and it is suggested that the end of a flat toothpick be moistened with vaseline and the contacting surfaces lubricated. Just wipe the surfaces with the lubricant, using as little as possible to smear them with a very thin film of lubricant. There are two other places requiring lubrication. One is the oil well in the top of the distributor gear housing and the other at the driving end cover. Use two drops of Berling magneto oil or 3-in-1 each week of service. **Do not use a cylinder oil,** as it will eventually gum up the bearings, which are Norma ball packed in vaseline when the magneto is assembled at the factory.

The truck dealer representing a make or makes equipped with Berling magnetos or a dealer or repair shop who gives service on Berling-equipped trucks, can stock a sufficient number of parts to replace those worn or damaged at a very small investment. These parts can be obtained from the nearest service station of the company or from the factory if no service station is in the vicinity, and at a discount satisfactory to the dealer. The isolated dealer, quite a number of miles from a service station, is warranted in stocking the parts listed herewith. The dealer is warned against the use of substitute parts, as they will not fill the bill as do those made by the manufacturer of the magneto. The list follows:

Catalog Number	Name of Part	Number
5247	Magneto Strap Washer	2
5226	Distributor Finger Assembly	1
5027	Contact Adjusting Wrench	2
5428	Magneto Strap Screw	6
5439	Cam Housing Clamp	1
5426	H. T. Terminal Nut	6
5320	Distributor Block Clamp Spring	2
5440	Oil Well Cover	2
5442	Timing Stop Spring	2
5198	Platinum Contact Screw	2
5014	Interrupter Lever	2
5448	Interrupter Lever Hex. Mounting Screw	2
5227	Brush Holder	1
5010	Cam Cover	1
5156	Shaft Nut	6
5206	Carbon Brush	6
5207	Carbon Brush Spring	6
5242	Driving End Bearing Mounting Screw	2

It Isn't Any Old Bus That Will Do for a Service Truck

The Spic and Span and Powerful Service Truck is a Valuable Asset to a Dealer's Service Department. Worn Out Passenger Car Chassis Are in the Discard

A HEAVILY laden truck went slithering over the country highway, its gait a medley of glides, rolls and slides, for the rain froze the instant it came in contact with anything solid. Minus chains or other traction devices the rear axle of the machine developed an inclination to stray from the highway. It veered, tacked and zigzagged, now sideling like the move of the knight on a chessboard and then pirouetting until the driver was dizzy. A car track, a depression and a right angle turn ended the driver's sufferings, for the wheels skidded and slid, and the differential functioned. A ditch with a boulder completed the cycle and when the driver emerged from the cab the truck was resting nicely—on its side.

Twenty minutes later the representative of the truck was listening to the driver's plaint over the phone. It wound up with the usual query of "What am I going to do?" "Oh, that's easy," replied the dealer. "I'll send the wrecker out. You just stick around and flag the car when it comes along."

Thieves Strip the Truck

An hour or so later the "wrecker" reached the spot. It was a flivver with a tripod or crane and a light chain block. It did not have sufficient capacity to lift one end of the wrecked truck let alone haul it out of the ditch. Neither was there any rigging for coping with such an accident. The man in charge of the "wrecker" made a hasty survey of the job and knew it was beyond his scope and he also realized he did not have the equipment to right the truck. And besides it was getting late and he had a "date" to take his best girl to the movies. And so his suggestion that they draw the water from the radiator and leave the job until the next day "when there would be good light and probably better weather," was favorably received by the driver who relieved his conscience by phoning his boss to the effect that the service station of the dealer was on the job, would do the work the first thing in the morning, "and that everything will be all right, boss." That night some one looted the cargo and made a very thorough job of it by stripping the engine of the carburetor and magneto, and removing the tools, etc.

* * *

Five miles north of the ditched truck lay another make upended and under practically the same conditions. This driver also phoned the service station of the dealer, but the telephone conversation was somewhat longer and more practical than in the first named case. This dealer turned the call over to the service manager who proceeded to extract all details from the driver. This service manager demanded minute information as to the damage to the truck, how it laid, etc., and when he had pumped the driver dry he told him to stick to the truck and not leave it, that a spare truck would be sent to take off the cargo and carry it to its destination.

Forty minutes later the cargo was shifted from the ditched truck to the car

supplied by the dealer and the driver was on his way, this time with chains, but not before he called up his employer and advised him as to the accident and that the wrecked car was being attended to. "And they will have my truck ready for me in the morning," concluded the driver. And it was, for with a proper capacity service truck,, power hoist and winch rigging, lights, etc., the wrecking crew made short work of getting the truck back to the road and towing it to the service station where the necessary repairs were made.

Now every story should have a moral —so has this one. By coincidence the owners of the trucks met at lunch the following day and naturally compared notes. Of course, the owner of the looted truck was more or less peevish and was more peeved when he learned of the service supplied to the other owner. Legally the owner whose car was robbed had no redress from the dealer and he knew it. Later the owners compared bills received from towing the trucks in and the owner of the looted truck found his bill considerably larger than his friend's although conditions were very similar.

Service Precedes Sales

Now the moral is that the peeved owner was peeved again and as he was replacing his horse-drawn equipment with trucks he was influenced by the incident —or misfortune—so much so that the efforts of the dealer to square himself fell on deaf ears. And the dealer of the other truck got the business, thus proving the contention made by a prominent factory sales manager, "that the good testimony of an owner is many times more valuable than a good salesman's argument, that in many instances service precedes sales."

Giving service to trucks damaged through accident or neglect is not a problem of the manufacturer, but one strictly up to the dealer. No dealer who hopes to be successful can afford to slight the service end. He should maintain a proper sized wrecking truck, suitably equipped, or make arrangements with some company that is equipped to give service. Trucks will meet with accidents. The congested traffic in the large cities, careless drivers on the highways and the increasing numbers of automobiles invite accidents. Accidents will tend to increase rather than decrease insurance rates and the decision of the insurance companies to advance its rates is based, they say, on statistics.

Better Service is Needed

The increasing number of trucks engaged in motor highway transportation will require a much higher grade of service than is being supplied at the present time. The country and city dealer is expected to give 24-hour service, for trucks will stray from the highways into ditches and fields when the drivers lose control. Proper service means that no time should be lost in extricating the truck and placing it in operating condition—and at the least possible expense.

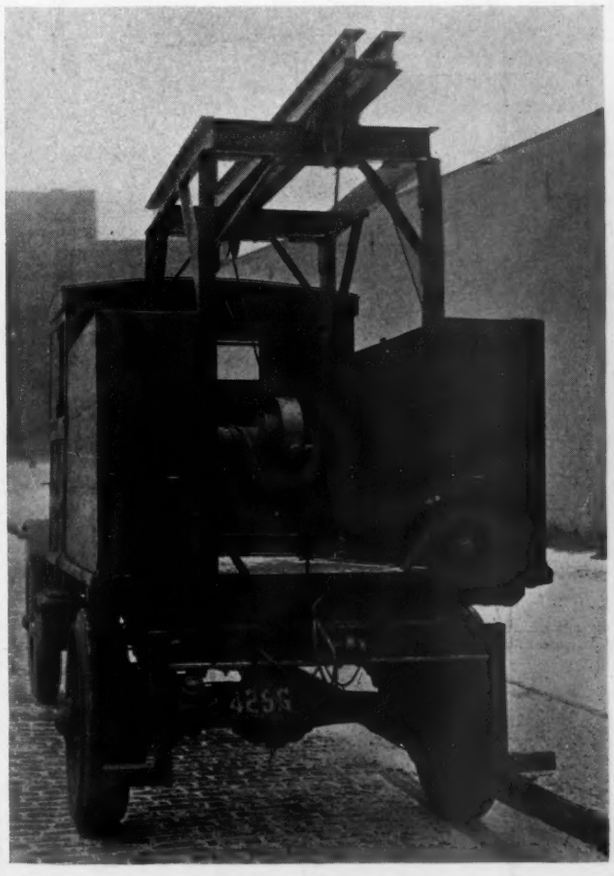
The dealer or repair shop that attempts to render service to a ditched or wrecked truck with a passenger car having a flimsy super-structure bolted to an unsubstantial body and with no rigging will meet with failure and lose prestige. The passenger car of ancient vintage may have capacity, but it lacks dependability. Because these vehicles are capable of towing, it does not mean they can right a turned over truck or haul one heavily loaded back on to the highway.

Why the Disreputable Car?

It has never been explained to the writer, at least not satisfactorily, why the machine selected for the service wagon or wrecker must be a car favored by our antediluvian ancestors. Why is it that the average service car in the automobile industry must have awry fenders, battered lamps, torn upholstery, worn out tires and faded paint? And why is it that the most disreputable apparelled mechanics are chosen to accompany the car?

The service truck or wrecker will frequently be found to be a trade-in and very often it is a make not represented by the dealer. Its condition is frequently such that to restore it would not be profitable from a sales point so the suggestion of the head mechanic or foreman to the effect it would make a good service bus with a little work finds favor with the dealer. Frequently these hastily assembled wreckers are very much in need of service themselves.

There are, however, some dealers who have given the service wagon the consideration it deserves and have evolved some very practical designs. Among these is the service truck constructed under the direction of George McGee, service manager of the Herrman Motor Truck Company, Inc., New York City, distributor of the Stewart trucks.





Above: The Super-Structure of the Herrman Truck Company's Service Wagon is Channel and I-Beam Sections Welded

The hoisting cable is made of steel and one man can control the raising or lowering of the hoist which is driven by the engine

Left: Rear View Shows the Tool and Spare-Parts Boxes Which Open Out and Supply a Workbench With a Vise

Experience taught Mr. McGee that the super-structure of the service wagon was subject to considerable stress, that elongation of the rivet holes occurred with the ordinary construction. It was also found that the tripod or crane superstructure lacked stability and that load distribution was not practical. The superstructure of the Herrman service wagon comprises four 5 in. uprights of channel section irons and these are surmounted by side and cross members of similar material. The uprights are braced with 1¾ x ¾ in. cold rolled steel both at top and bottom, and the rear lower brace has a bearing on the rear cross frame member.

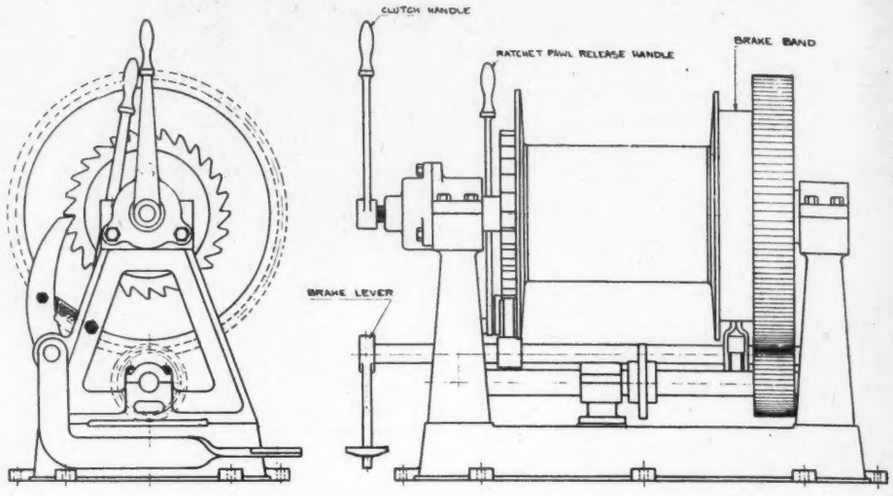
Super-Structure Welded Throughout

Support for the pulleys of the winch or hoist is by two 5 in. I-beam sections, nine feet in length. With the exception of the side braces all of the super-structure is welded. The steps and rear bumper are also welded. Provision is made for towing and for compensating back lash and starting stresses by the use of two coil springs in a diamond shaped sub-frame that is welded inside the chassis frame.

The winch or hoist is a special construction designed by Samuel Stimmel, New York City, and is mounted directly in back of the driver's cab. One of its features is the use of a double contacting type of cone clutch that is controlled by a handle, and it requires but a short movement of the lever to throw the male portion into engagement with the female or drum. An easy but positive engagement is noticeable in the design, and the lever is adjustable to wear.

Power is Lever-Controlled

In addition to the lever control there is a foot operated brake lever which actuates a band on the drum of the windlass, enabling the operator to control the lowering of the hoist and in the case of a truck to control the lowering to a nicety. The brake can also be used as a control in hoisting. Another feature is a ratchet pawl release which permits the operator to engage or disengage the ratchet from a point near the clutch handle. The capacity of the winch is two tons on a single line at a rope speed of 60 ft. per minute. The winch can be equipped with a gypsy head on one end of the drum if desired. A steel cable, ⅞ in. diameter, is used and it is of sufficient length to meet every requirement in wrecking service. The energy for driving the drum is derived from the Stewart power-take-off, and drive is through a chain and sprockets, worm and worm gear to the driving gears of the drum which have a 5:1 reduction.



End and Side View of Stimmel Clutch Controlled Winch

Control of drum in lowering and hoisting is by a foot-operated brake band. A feature is a ratchet pawl release controlled by handle

Instead of utilizing a standard 1½-ton chassis Mr. McGee equipped the chassis with a 2-ton rear axle and springs and installed a 3-ton gearset, which affords the following gear ratios: First, 4.8:1; second, 3:1; third, 1.6:1; fourth, 1:1; reverse, 6.5:1. The total reductions from the engine to the rear wheels are: First, 48:1; second, 30:1; third, 16:1; fourth, 10:1; reverse, 65:1.

Pneumatics, 36 x 6, are used in front and solids, single, in the rear. There is a power driven tire pump, electric lighting with trouble lamp and a spotlight. The tool boxes are five ft. high and seven long and are constructed so that when the boxes are open there is supplied on the top of the box a workbench with a vise attached. Tools and all equipment essential for road work are carried in one box and the other is used to store wheels, axles, tires, spark plugs, etc.; in fact, such spares as experience has taught are essential for roadside repairs and replacements. The service wagon is nicely painted and lettered, and it is the orders of Mr. McGee that it be kept washed and clean at all times. It was the intention of the company to exhibit the wagon at the show, but it was not completed in time.

In addition to its ability to handle all accident work or roadside repairs, which is an asset to any dealer, the service truck proves to the users of Stewart trucks that the Herrman Motor Truck Company is equipped to put a truck back on the road in the minimum of time and at the least possible cost. The service wagon is an advertising asset that must not be overlooked.

Air Compressors and Location of Air Lines for Filling Stations*

THE location of the air lines should be very carefully considered. The practice of placing them at the curb is, I believe, a wrong one. The purpose of the drive-in filling station is to bring the automobile driver into the property. When the free air is intended to act as a drawing card, an air delivery station located at the curb has just the opposite effect. Cars that are being served with air are liable to block or interfere with the easy entrance to driveway approaches, except in cases of very large lots. Air stations when so placed are also usually hard to reach when leaving the property.

If a person carefully watches an air station located in this position, it will be found that in the majority of cases where a man stops for air at the curb before being served with gasoline, he will go on to the next station to spend his money. He will do this rather than make the swing out into the street that is usually necessary in order to get into driveway.

When this equipment is located inside the property it should be at least twenty-five feet from any pump or driveway entrance and should be so placed that the cars being served with air will not block or congest the driveway approaches or the pumps. My advice is to use only 3-8 in. armored air hose in twenty-foot lengths and see that it is equipped with the best air chuck attainable.

If you are going to have a free service of any description, do it in such a way that the public will be attracted and recognize its value. A few of the companies are using a combination air and water post others are using a pipe standard equipped with a swinging counter-balanced arm that lifts the air hose up off from the ground when not in use. When water taps are located outside of the building, they should be equipped with a self-draining, non-freezing shut-off.

*This is the fourth of a series of articles written by F. A. Bean, Consulting Engineer, Wayne Oil Tank & Pump Co., on the planning, arrangement, equipment and management of filling stations.

Do not operate the air compressor in the sales room if any other space can be used. This is disadvantageous both on account of the noise and opportunity for customers to meddle with it. If it must be placed in the sales room, be sure to cover it with a sheet metal case.

See that the compressor and its motor are installed and oiled at such intervals as recommended by the manufacturer. Often compressors are automatically controlled and proprietors fail to give such machinery due and regular attention.

Floor space is always at more or less of a premium in a filling station. It is, therefore, necessary to secure a compressor that wil occupy a minimum of floor space and at the same time have a capacity equal to the requirements placed upon it. Many manufacturers now have compressors on the market that are small and compact, but, nevertheless, are very efficient. Several of the new models are using a vertical instead of a horizontal tank with the compressor, motor, etc., mounted on top of the tank.

The buyer should assure himself that the automatic starter and cut-out are absolutely positive in their action and that the tank is of such thickness of metal and the seams are so made that there is little possibility of an accident. Several very costly accidents have occurred at filling stations due to light-weight tanks and automatic cut-outs refusing to work. Compressors known as the two-stage type are very desirable for filling-station use.

The tank should be of not less than 3-16 in. steel. Some localities require ¼-in. tanks. The capacity should be 25 cu. ft. of 40 cu. ft. and should show a hydrostatic test of from 300 to 400 pounds pressure and have a working pressure of not less than 180 pounds.

The compressor should be able to deliver from 3 to 4 cu. ft. per minute at 250 r.p.m. It should start automatically when the pressure has droped to one hundred pounds and cut out when it has reached 150 pounds. A compressor of this capacity will require a motor of from one-half to one horse-power.

Painting

Do not use loud and gaudy colors either inside or outside of the station. There are a large number of stations throughout the country that are decorated in such a manner as to have a tendency to repel patronage rather than attract it.

A dark color such as solid black, dark green or brown is best for the inside finish and should be used from the floor up to a height of three or three and one-half feet, or to the window sill line. This will materially aid in keeping the walls from showing dirty and greasy hand marks and will not show so plainly the dirty splashing which results from cleaning the floor. The balance of the interior should be a light cream, buff, very light grey, green or white in order to obtain the best effects. These shades are clean in appearance and give the best results.

Dark colors are better for the exterior up to the window sill line and should be used particularly when soft macadam, cinder or dirt drives are used. Door and door casings should also be of a dark color. It is preferable to have balance of the exterior in a light color. White shows up to the best advantage both by day and by night.

Everything about the station or grounds should be painted at least once each year, preferably as soon as the weather has become settled in the spring.

All pumps should be painted twice a year and oftener if necessary. Do not let them look dull or dingy. Gasoline pumps and oil containers will lose their lustre very quickly, even though finished in a most careful manner. This is due to fumes, small spillage, and exposure to all kinds of weather. White is not recommended for this class of equipment, as gasoline and lubricating oil will turn it a dirty, streaked yellow in a short time. It is also an extremely hard color to refinish smoothly.

Use only high-grade paints. Cheap, inferior grades all cost more money in the long run. When stations have a plaster finish inside, use only paint. Do not try to save expense by using whitewash, water paint or calsomine. Insist that all paint used on buildings and about the grounds shall be pure white lead or color ground in oil. The paint for gasoline pumps and lubricating oil tanks should be color ground in japan.

Aftersale Service for Motor Trucks

By ROBERT F. WOOD, Advertising Department, The Autocar Company

MAN has not yet, and probably never will, be able to devise a machine which will work indefinitely at 100 per cent. efficiency without expert oversight and attention. Although we see today so many motor trucks and automobiles operating everywhere under the guidance of people who know nothing about mechanics, this does not prove that the fundamental necessity for expert attention has beene overcome.

No one ever heard of such a thing as aftersale service in connection with a horse or a wagon, but motor vehicle manufacturers are constantly talking about the amount and kind of service which they are able to give after their product has reached the hands of the ultimate consumer. One might suppose that so much discussion of aftersale service would arouse the suspicion of diffident prospects and undermine confidence in the ability of a motor vehicle to do what is claimed for it.

The constant demonstration on every street and highway of motor vehicle efficiency, however, is continually offsetting any hesitation about buying which the necessity for service might arouse in the mind of any practical man.

The ordinary man then, considering the purchase of a motor truck, is confronted by a straight business proposition. He knows that it is a machine, wonderful in its perfection, but nevertheless subject to the conditions which govern all machinery. Therefore, the question for him to settle is not only the capacity and ability of any truck which he may have under consideration, but also what kind of service he can get after he has made this purchase. He will want to know where that truck is manufactured and whether the manufacturers of it can constantly control and put within convenient reach of himself, a supply of all parts.

He will want to investigate with particular care, the service facilities of the selling organization. They are the people to whom he must look. The manufacturer may be located in a distant city and totally unknown to the truck owner. The truck itself stands as a personal relationship between the man who buys it and the man who sells it. If the truck dealer is unable to satisfy a prospective buyer that he constantly able to render expert aftersale service, the buyer should hesitate about buying his truck.

This should not be taken to imply that the truck owner should expect to receive free aftersale service. If his horse gets sick or needs shoeing, he certainly would not expect the man who sold him the horse to pay the veterinary or blacksmith bills. The horse owner recognizes that the veterinary and blacksmith are in business for themselves and must be paid for the services they render. The same should be equally true of service rendered by an organization whose business is the sale and maintenance of motor trucks.

But back of this whole problem and affecting it vitally, must be the attitude of the manufacturer toward the user. Ii the executive forces in control of the entire manufacturing and selling policy of a motor truck company recognize the vital importance of aftersale service, there will be no lack of it for the truck owner. The motor truck manufacturer who makes aftersale service an important part of his fundamental policy will see to it not only that aftersale service is sanely developed and provided for through his selling organization, but will also, and this is really of more importance—make the manufacture of spare parts a fixed item in his program of production with the result that such parts will be available wherever needed. Such a manufacturer will not permit a sudden rush of orders to swamp his production end to the exclusion of the manufacture of spare parts and he also will control his sales organization in selling trucks into a region where reasonably good aftersale service cannot be provided.

The problem of service for motor vehicles has, of course, many ramifications, but in its fundamental principles it gets down to this: Motor vehicles do require expert aftersale service. The average buyer of a motor truck cannot be expected, nor does he usually intend to acquire the amount of technical information which would make him expert, nor to tie

up his money in a complete supply of spare parts.

He will instinctively look to the man from whom he has bought his truck for such information and parts. The attitude of the man who sells trucks toward aftersale service, and to a degree, his ability to render such service, is strongly influenced by the policy of the company which manufactures the trucks he sells. Therefore, the motor truck manufacturer really can control the situation. If his constant interest is centered in his own trucks, he will evolve a policy of aftersale service which will constantly guarantee and protect the investment of the man who buys and uses his trucks. The motor truck manufacturers who are making the most substantial progress today are those whose manufacturing and selling policy is firmly grounded on a definite conception of the constant necessity for complete aftersale service.

An Inspector's Report That is Thorough in Detail

Dealers, distributors and garage men who are looking for an inspector's report that is comprehensive in its scope, might do very well to use the report that is illustrated herewith for example. This report which was compiled by the Available Truck Company of Chicago, is exceptionally complete in detail, and at the same time illustrates the thoroughness which this company insists upon in these reports by its inspectors. In utilizing this report, each inspection is made in the presence of the owner or driver of the truck and at the time of its completion, the owner or driver signs that report, after the customer's name, and it is signed by the inspector then. It will be noted that one column has been set aside in this report wherein the inspector can report the attention given by him by placing a cross after each item adjusted. The report is laid out in a manner that will permit the inspector to begin at the forward end of the truck and each inspection and operation can be noted as he works toward the rear of the truck, finally winding up with the inspection of the tires so that each particular item is reported upon and not skipped.

On the back of the report is printed an Inspector's Confidential Report which gives a Bird's-eye view of the condition under which this truck is operating, both as to the driver and the overhauling, if any. Furthermore, upon the completion of the report, other than the confidential report on the back, customer or driver signs this report in the presence of the inspector, all of which provides a check on the inspector also; he in turn sending one copy to the company, a copy to the owner or driver and retaining a copy for his own record.

Questions asked on the back of this report, are as follows:

Does Truck Receive Good Care?

Is Truck Subject to Overloading?

Is Truck Subject to General Abuse?

Is Driver Familiar With Operations of Truck?

Is Driver Capable of Operating Truck?

Does He Like AVAILABLE Truck?

Has Present Driver Driven His Truck More Than 30 Days?

Conditions Satisfactory? If Not, Why?

Has Driver Had Previous AVAILABLE Experience?

(Form 448—5M—1-20)

Available Trucks

AVAILABLE TRUCK CO.

KILPATRICK AND NORTH AVENUES

CHICAGO

INSPECTION REPORT

NOTE—Items marked "X" have been attended to by us. Any other repairs needed should be attended to at once.

Owner .....

Address .....

Owner's No. .....

Serial No. ..... Model .....

Engine No. ..... Frame No. .....

Date .....

Inspector .....

Customer's Name .....

Per .....

KEY

1. O. K.
2. Should be adjusted.
3. Should be tightened.
4. Should be rebushed.
5. Needs slight repairs.
6. Needs extensive repairs.
7. Should be overhauled.
8. Should be renewed.
9. Improper lubrication.
10. Can only report after dismantling.
11. Should be cleaned.
12. See General Remarks.

CONDITION OF CAR

MOTOR	Req. Attention	Attention Given
Crankshaft		
Annular Bearings		
Connecting Rods		
Connecting Rod Bearings		
Pistons		
Cylinders		
Upper Crank Case		
Fly Wheels		
Carburetor		
Lubricator and Pipes		
Dash Oil Pump		
Water Pump		
Water Pump Connections		
Radiator		
Magneto		
Timing		
Valves		
Ignition		
Motor Bolts		
Cam Shaft		
Valve Plungers		
Magneto Drive Shaft		
Magneto Spur Gear Shaft		
Inlet Manifold		
Muffler and Pipes		
Governor		
Batteries		
Wiring		
Fan Assembly		
Self-Starting System		
TRANSMISSION		
Clutch Shaft		
Clutch Shaft Bearings		
Main Shaft		
Main Shaft Bearings		
Countershaft		
Countershaft Bearings		
Clutch		
Slide Gear		
Idler Gear		
Slide Rod		
Universal Joints		
Drive Shaft		
STEERING CONTROL		
Spindles		
Spindle Bolts		
Spindle Bushings		
Spindle Arms		
Spindle Arm Pins		
Spindle Arm Bushings		
Cross Tube		
Steering Link		
Steering Gear Case		
Steering Column		
Steering Column Bushings		
Steering Sector		
Steering Sector Shaft		
Steering Wheel		
CLUTCH CONTROL		
Foot Pedal		
Pedal Shaft		
Pedal Shaft Yoke		
Clutch Cross Shafts		
Clutch Spring		
GEAR SHIFT CONTROL		
Hand Levers		
Hand Lever Bracket		
Gear Shift Sector		
Gear Shift Finger		
Gear Shift Fork		
FENDERS		
Front R. S.		
Front L. S.		
Rear R. S.		
Rear L. S.		

THROTTLE CONTROL	Req. Attention	Attention Given
Throttle Rod		
Accel. Pedal and Shaft		
Sector		
Ball Joints		
BRAKE CONTROLS		
Foot Pedal		
Foot Pedal Shaft		
Brake Cross Shaft		
Brake Pins		
Emergency Brake Sector		
Emergency Pawl and Case		
Internal Brake Bands		
External Brake Bands		
SEAT STRUCTURE		
Dashboard		
Dashboard Hood		
Dashboard Support		
Seat Sills		
Seat Box		
Toe Board		
Floor Board		
EQUIPMENT		
Head Lights		
Side Lamps		
Horn		
Tail Lamp		
Mud Pans		
Gas Tank		
Frame		
Hood		
Hubodometer		
Muffler		
Oil Cups		
Grease Cups		
Tool Box		
REAR AXLE		
Housing		
Bevel Drive Pinion		
Pinion Bearings		
Truss Rod		
Differential Assem.		
Differential Gear		
Differential Bearings		
Axle and Flange		
Wheel Bearings		
Wheels—Drums		
Tires		
SPRINGS AND FITTINGS		
Spring Clip and Nuts		
Rear Springs		
Rear Spring Brackets		
Rear Spring Shackles		
Rear Spring Bolts		
Spring Center Bolts		
Front Spring Hangers		
Front Spring Gooseneeks		
Front Spring Shackles		
Front Spring		
Front Spring Bolt and Bushings		
FRONT AXLE		
Wheel Bearings		
Wheels, Front R. S.		
Wheels, Front L. S.		
Wheels, Rear R. S.		
Wheels, Rear L. S.		
TIRES		
Front R. S.		
Front L. S.		
Rear R. S.		
Rear L. S.		

Service Station and Repair Shop Appliances

Soper Rib Retread Mould Vulcanizer

A new vulcanizer with a rib tread grooved into the mould is being manufactured by the Soper Vulcanizing Mfg. Co., 1036 S. Main St., Los Angeles, Cal.

The vulcanizer has drop forged steel clamps and the sand bag is also shaped to fit the tire. It has a semi-cure feature at each end to prevent overcuring at the lap. The inclosed fire-box is stated to give a large heating surface and makes possible steaming up to 50 lb. in 20 to 25 min. Another feature of this outfit is the wood-fibre marking blocks on the ends of the moulds, which prevent the rubber from flowing or blistering at the end of a cure. Each one of these outfits is equipped with five powerful clamps, a gas burner, steam gauge, safety valve, funnel, water valve, overflow valve, sand bag, wrench, and steel pressure iron.



Retread Mould Made in Three Sizes
The generation of steam in this apparatus is said to be rapid

Three sizes are offered: the No. 1 for 3 and 3½-in. tires at $115; No. 2 for 3½ and 4-in. tires at $125, and No. 3 for 4½ and 5-in. tires at $135 f. o. b. Los Angeles.

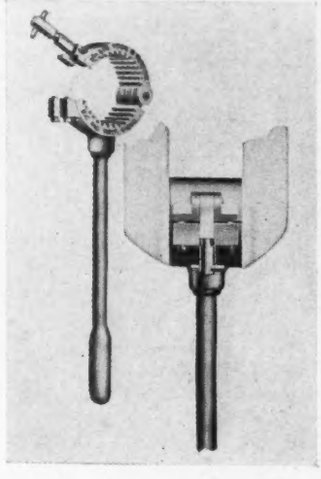
Halee Crankshaft Reamer

The Halee Crankshaft Reamer, manufactured by the H. A. Lee Tool & Mfg. Co., 1505 McGee St., Kansas City, Mo., is a very useful tool for the repair shop and service station.

The teeth of this tool are integral with the body. The hinge construction is of the taper pin, piano hinge type. An adjustable tee-handle latch closes the upper and lower tooth positions together, making possible a very fine adjustment for the material to be removed. For duplicating work the reamer may be set to a certain size by adjusting screws at each end of the latch. For instance, if the first bearing has been trued up the adjusting screws are set to this position; the balance of the bearing then will be finished to the same size.

The outside dimensions of the Halee crankshaft reamer are confined as close to the shaft as possible, permitting of its use under the engine on connecting-rod throw-bearings without removing the crankshaft. It is not only simple of construction, and of easy operation, but it saves the time and expense incident to the dismantling of the engine and sending the crankshaft to an outside machine shop.

The Halee polishing tool has the same type construction as the reamer, using emery cloth instead of the teeth for polishing a bearing. It is also designed for use under car, on bench work or road service and is furnished with the Halee crankshaft reamer.



Two Views of the Halee Crankshaft Reamer

The prices range from $60 to $90, according to the size.

Marquette Split Rim Tool

A new tool for expanding and contracting split rims especially for use in the garage or service car has been brought out by Marquette Mfg. Co., Inc., 616 Endicott Bldg., St. Paul, Minn. This tool is made of steel throughout and is very sturdily constructed, yet light enough to be moved about and used in the service car also. The fact that this tool can be folded up increases its portability. The tool retails at $25.

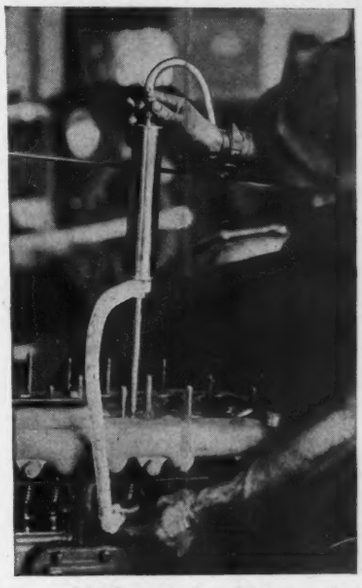


Marquette Split Rim Tool

Contracting and expanding is accomplished by revolving the handle in opposite directions. This tool is strong and can be bolted to bench or stand.

Trexler Air-Operated Valve Spring Compressor

A new utility tool for the garage is the Trex Air-Operated Valve Spring Compressor recently announced to the trade by the Trexler Co., 1418 Walnut St., Philadelphia. It is a practical tool for taking the valve out or putting it in. The tool is connected with a compressed air system. When applied to the engine, it will compress the spring immediately upon turning the valve on and the pin or key can be readily removed or inserted. The tool is made of steel and is relatively light and strong for the heavy work it does. It is stated to be universal, being adaptable to practically all types of engine. This tool allows the use of both hands after the spring is compressed. The net price is $15.



Trex Air-Operated Valve Spring Compressor, Showing Method of Manipulation

Holly Line of Speed Wrenches

Speed and efficiency constitute some of the underlying principles incorporated in the Holley line of speed wrenches, marketed by the Holley Tool Mfg. Co., Mason & 12th Sts., Omaha, Neb. These speed wrenches are featured by the pressed-steel smooth-end knobs, cold-rolled screw stock steel, hardened tool steel sockets and the Parkerized finish.

In general, the high-speed wrenches are made in four different lengths of shanks, 6, 10, 16 and 20 in. The lengths being made of ½ or ⅝ in. cold-rolled screw stock steel. The knob is pressed steel with center thrust. The squares and the socket are a snug fit and have a ball lock to keep the socket from falling off the handle. The combination arm of the wrench is also of cold-rolled stock, square on one end and riveted to the combination block, which is of pressed-steel, in three

separate parts with a swivel joint. The coil spring is used only when the wrench is used in its combination form. The sockets are made of steel 1¾ in. long and broached square on one end and hexagon on the other.

Many combinations are possible with the various units offered by this company. Among others the "T-Handle" wrench and the Half-Speed Wrench are included in this line.

The Holley No. 5 Combination Kit, which contains several lengths of Speed wrenches, half-speed wrenches, a retaining arm and block, 20 sockets and a container, lists at $30.

The Weaver Introduces New Equipment for Service Station

The underlying object of the construction of new appliances and equipment for service stations and repair shops is econ-

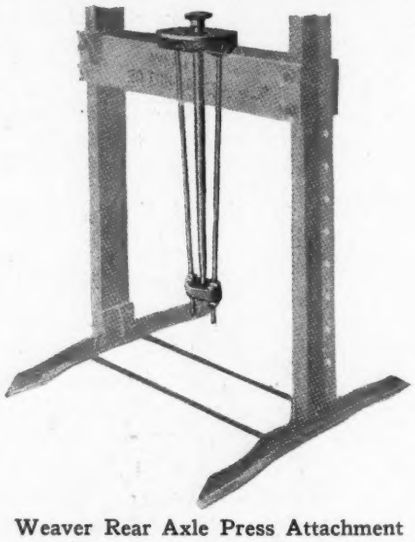


Weaver Wire-Wheel Repair Stand
A convenient stand for truing and repairing wire wheels

omy in time and perfection in repairs. Three new products built along this line by the Weaver Mfg. Co., Springfield, Ill., the Weaver Wire Wheel Repair Stand, The Weaver Universal Axle Stand and the Weaver Rear Axle Attachment for the Weaver Forcing Press have been announced.

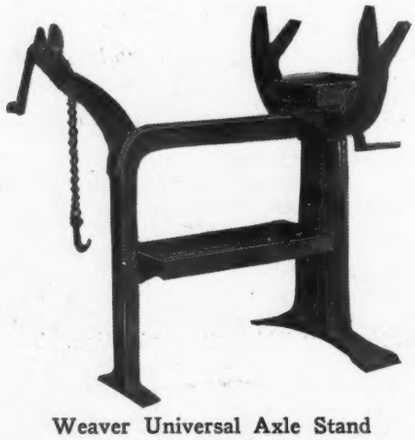
The Weaver Wire Wheel Repair Stand greatly facilitates repairs, re-spoking and truing up of wheels. With this the tire man can quickly and satisfactorily touch up little defects in the wheel at little expense to the owner, while the tire is being repaired in the meantime. The wheel is supported in a manner similar to that when attached on a car. An indicator on this device assures proper alignment. If the repairs necessitate the replacement of a spoke, one can be taken from a small cabinet located on a column of the device within easy reach of the workman and in which are contained a variety of spare spokes. The main stand of this device is of heavy steel tubing, supported by a broad iron base. The keeping together of small tools used in the repair of the wheel is possible by the provision of a tool-tray positioned conveniently below the wheel mounting of the upright.

The Universal Axle Stand, although simply constructed, has been found to greatly facilitate rapid work. One prong of each crotch of this stand projects at an angle of 45 degrees so that the axle can be slipped over them, between the truss rod and the axle, when placing the axle on the stand. When the axle has



Weaver Rear Axle Press Attachment
Attachment for the Weaver Forcing Press

been finally adjusted on the stand, the body of the axle rests on the seat of the crotch. The axle then is clamped securely in the crotch by chains supplied for that purpose. It is frequently found difficult to separate the torsion tube from the differential housing. Provision has been made on the left side of the stand for such a contingency by a crank that conveniently draws it out. This stand has



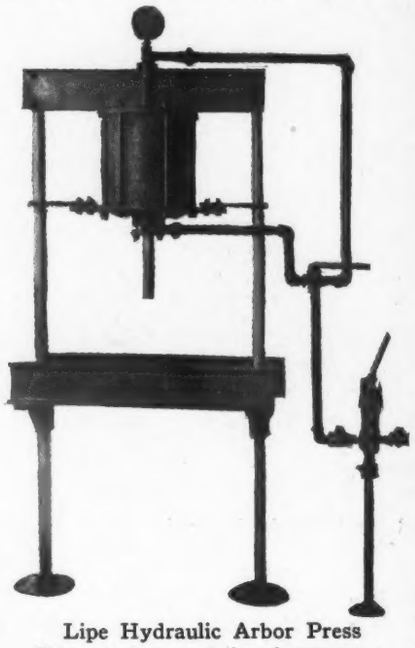
Weaver Universal Axle Stand
Handles any type of rear axle

a wide, heavy base, making it impossible to tip it over, a large tool tray and a removal oil pan.

The Rear Axle Attachment for the Weaver Forcing Press is particularly useful in Ford repair work, such as is entailed by placing the pinion on the axle. The supporting block in the lower end of the rod is hollow or concave to receive the lower end of the axle. The upper end protrudes through the opening in the face plate, permitting the pinion to be forced on by direct contact with the press screw. To provide sufficient depth or length to receive longer shafts, the company designed the pockets in the side of the face plate so that ⅝-in. side rods can be substituted in place of the shorter side rods. The face plate of the press has also been reinforced. The side rods are ⅝-in. high carbon stock, 36 in. in length. The shipping weight complete with the face place is 35 lb., less the face plate, 17 lb.

Hydraulic Arbor Press

A new press, operated hydraulically, for use in garages and machine shops, is being manufactured by R. M. Lipe, 230 Alameda Ave., San Jose, Cal. The press has 20-ton capacity, is 32-in. wide, and has a working height of 4 ft. which



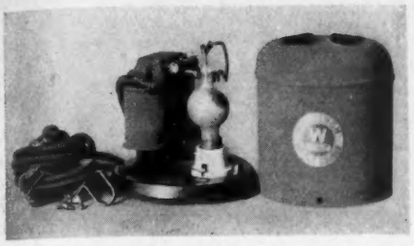
Lipe Hydraulic Arbor Press
This press has a capacity of twenty tons

may be increased by sinking a hole beneath the press. The price is $175 f. o. b., San Jose, Cal.

The Westinghouse Rectigon Battery Charger

The newest and latest product offered by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., is the Rectigon Battery Charger. This device was particularly designed for private garage use, and is especially useful in replenishing the power of an exhausted battery incident to extra strains imposed upon it when an unusual amount of easy driving or starting and stopping takes place.

This product, as in many other Westinghouse products, has no moving parts, oil or grease. The base is cast iron and the cover is pressed steel and fits over all the parts, being attached to the base by three machine screws The top is constructed in the shape of a handle, enabling it to be easily carried. The transformer is mounted vertically. The fuse is on the panel at the top of the transformer. The bulb socket is mounted on the base of the device and just in front of the transformer. Leads for A. C. and D. C. connections are at the base. The



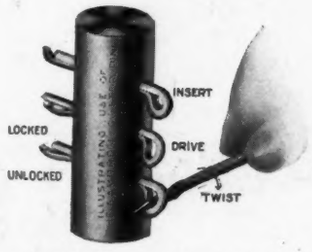
Westinghouse Rectigon Battery Charger

A. C. leads have separate attachment plugs and the D. C. leads have clips to the storage battery. The prices range from $18 to $28.

American Chain Brings Out Two New Products

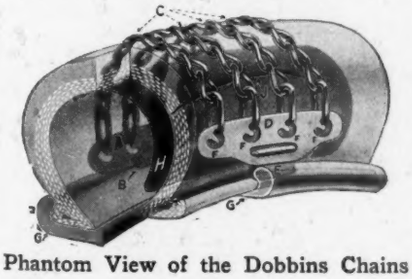
The two new products recently brought out by the American Chain Co., Inc., Bridgeport, Conn., includes the Dobbins Blow-out Chains and the Campbell Hammer-Lock Self-Spreading Cotter Pin.

The Dobbins Blow-out Chains are designed to reinforce a bad blow-out while on the road. They are made for straight side and clincher tires. If a blow-out occurs the tube can be repaired and this chain used to reinforce the tube. They are attached while the tire is deflated and upon being inflated the break in the tube is drawn together tightly and the chain cannot shift its position. The prices range from $1 to $1.75 for the 3-in. and 6-in. sizes, respectively.



Campbell Hammer-Lock Cotter Pin
This illustration shows how pin is locked and also removed. This pin can be used several times

The Campbell Cotter Pin is especially useful for quick repairs, all operations being done from the eye end. The useful feature of this pin is the fact that it can be locked in places where its points are inaccessible for spreading. The points of this pin are close together and well tapered, enabling the easy insertion of the pin. It is driven in until the points are of equal length, which operation causes the flattening of the eye until the shorter or straight branch is forced to ride up and over the upturned pointed end of the other end, thus locking it. This automatically spreads and locks the pin in place. The pin can be removed, if desired, by inserting a screw driver in the eye and extracting it with a twisting motion. This pin can be used several times over.



Phantom View of the Dobbins Chains

Century Cam Hoist

The Century Hoist Mfg. Co., Lock Haven, Pa., has recently placed on the market a new and simply constructed cam hoist, known as the Century Cam Hoist. This hoist is featured by its simplicity in design, lightness in weight and interchangeability of parts.

The one-piece housing is made of gray iron. A roller clutch on the bushing in the cap of the housing controls the action of the chain wheel which forms a brake that governs the smooth transmission of the load. The camshaft is supported by the bushing in the cap. On the end of the camshaft the hand wheel is pinned to revolve the cam which engages in the lift wheel.

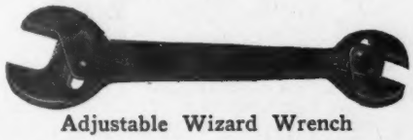


Century Cam Hoist

The construction of the chain guide of the block is such that it will retain on the hand wheel at any angle. The block is so designed that the clutch works instantly without any backward motion.

New Wizard Wrench

A new wrench has been added to the Wakefield Wizard line of wrenches, made by Clarence E. Wakefield, Worcester, Mass. This is the Wakefield Wizard Wrench which can be adjusted to any one of ten sizes, thereby replacing five ordinary open end wrenches. This wrench has the following sizes in it:

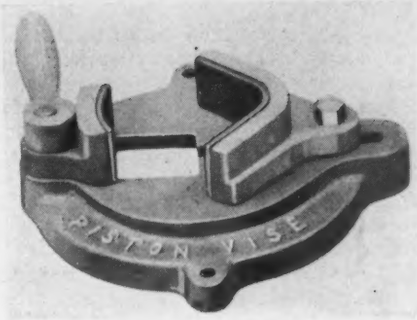


Adjustable Wizard Wrench

¼, 5-16, ⅜, 7-16, ½, 9-16, 19-32, 11-16, 25-32, and ⅞-in. It accommodates ten U. S. standard sizes, 5 S. A. E. Standard sizes, 6 U. S. Standard cap screw sizes and 4 set screw sizes. The list price of the wrench is $1.50.

Piston Vise for Shop

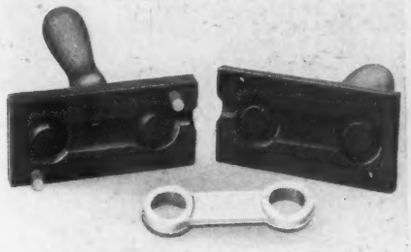
A new addition in the equipment line of the Continental Auto Parts Co., Columbus, Ind., that is practically a necessity in any service station or repair shop, is the Piston Vise. This tool is quickly adjusted and is lined with leather to prevent damage to the piston. It is adjusted to any size piston and when once set to the first position, tightening and loosening of the piston in the vise is accomplished by the lever, shown at the left. It will handle pistons from 2⅞ to 6-in. diam. and the vise can be permanently attached to the bench.



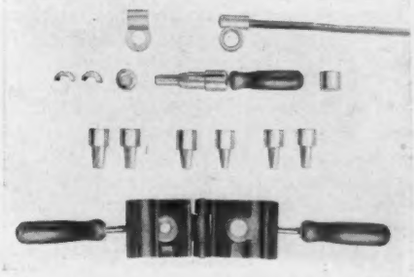
Piston Vise

Moulds for Casting Battery Parts

A variety of moulds for casting lead terminals, post connectors and other parts on all standard storage batteries are being manufactured by the Associated Electric Service Station, 105 Monroe St., Chicago, Ill. Moulds of all descriptions for various battery parts are made. A particularly popular mould is the combination mould which forms 14 different standard terminals, right and left, positive and negative. The connector moulds are made in different sizes all forming the same style of connector. Brand new battery connectors may be made with these by the different connector moulds. Post and strap moulds may also be obtained. The screwhead moulds will cast heads upon the two standard sizes of screws, ⅜



Connector Mould
Made in five different sizes all forming the same style of connector



Combination Mould Outfit

and 5-16 in., also new heads on the old terminal screws and on any steel or brass hexagonal headed screws.

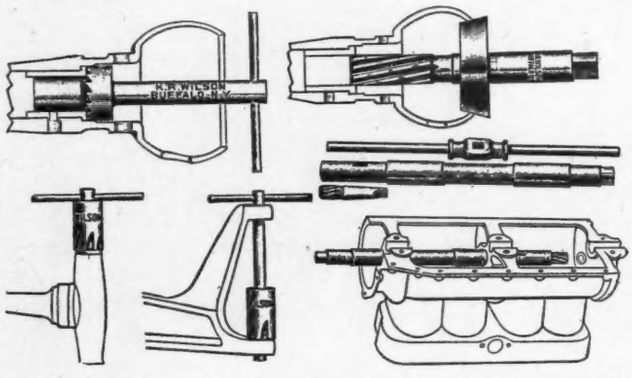
With these moulds means are provided for making clean lead parts, thus enabling the battery station to turn out a battery in first class condition at a small cost as the new lead parts are made at practically no expense, the junk thus being utilized in casting the new parts.

The moulds are constructed of a special Ferro-Silico-Manganese alloy and fitted with heat proof handles.

Wilson Brings Out New Tools

Many useful tools and special reamers, some of which were first shown at the New York Show, are being offered to the trade by the K. R. Wilson Co., 10 Lock St., Buffalo, N. Y.

One device is a tool that facilitates the insertion of the universal joint pin. It is known as the Propellor Shaft Bearing End Mill. When the length of the bearing flange is such that the universal joint cannot be forced in place, the availability of this apparatus can be appreciated. It retails at $5.



New Wilson Tools

The upper left is the Propeller Shaft Bearing End Mill; the upper right is the Propeller Shaft Bearing Reamer; the lower left is the End Mill and Arbor for facing the spindle body bushings and worn axle forgings and the lower right shows the Rear Camshaft Bearing Reamer.

A Shaft Reamer, which sells at $6, including a jig, gives perfect alignment when reaming. The point of the reamer is ground on a long taper and is self-centering. The jig assures positive centering at the rear end.

Another product is the Combination End Mill and Arbor designed for facing spindle body bushings and worn axle forgings. With this considerable time can be saved and a more satisfactory job can be turned out, since the spindle bushings and axle forgings can be faced off to a perfect fit. This tool sells at $5.

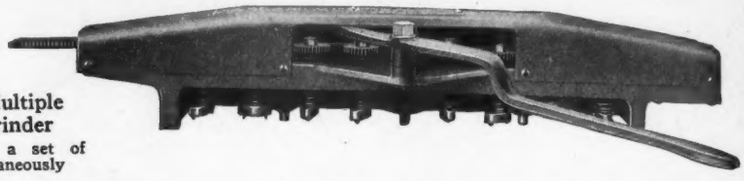
Still another new reamer is the Camshaft Aligning Reamer, designed for exclusive use on the rear bearings. The accompanying illustration showing the bearings complete in position on the cylinder block gives a comprehensive idea as to the utility of this device. With this device the rear camshaft bearing can be reamed out in perfect alignment with the front and center bearing. Perfect alignment being insured, it eliminates future prospects of possible knocking from the crankshaft and the quick loosening of new bearings.

The Maremount Mfg. Co., automobile and truck spring makers, have purchased a site of 100,000 sq. ft. of land in Chicago. Producing capacity will be greatly increased.

Corbin Multiple Valve Grinder

A new tool, which is to permit the grinding of the eight valves of the Ford engine simultaneously, has been announced by the P. & F. Corbin Co., American Hardware Corp., Successor, of New Britain, Conn. It is known as the Corbin Multiple Valve Grinder. With its use much time is saved in grinding in a set of valves.

It is attached by turning down one wing nut which fastens the clamping bar to the cylinder block of the engine. As pressure exerted by the coil springs is equal, a positive and equal grinding of each valve is insured. The eight spindles are directly over the valve stems, a feature that makes for an absolutely concentric ground seat. The gears are cut bronze. The driving rack is steel with cut teeth and the spindles are drop-forged. The pins are case-hardened and easily replaced. Six extra pins are supplied with each tool. There is a pocket with a solid cover built into the base of the carriage containing twelve under - the - valve springs. The price of this tool is $60 and the weight is 28 lb.

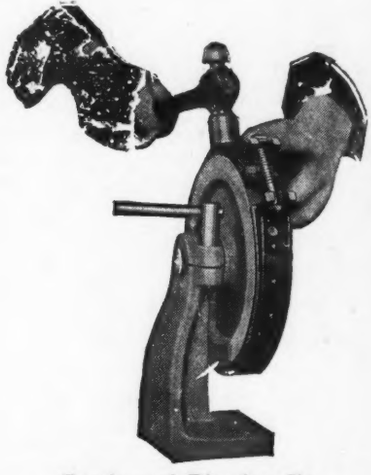


Corbin Multiple Valve Grinder

It will grind a set of valves simultaneously

Continental Riveting Jig

A convenient item for the repair shop when Ford work is done, is the Continental Riveting Jig used when tightening, straightening, and relining transmission banks of the Ford car. This device, produced by the Continentl Auto Parts Co., Columbus, Ind., is shown herewith. This riveting jig has been designed to overcome the difficulties and speed up the work. It can be bolted to a convenient work-bench and the band is placed around the jig and drawn down tight. The heads of the old rivets can be readily cut off with a cold chisel and any kinks or bend can be straightened out. The new lining is placed around the mandrel and the steel bank fitted over it properly. It is then firmly clamped and rivets driven in. They will clinch themselves on the machine surface of the mandrel. The jig can be revolved and locked in any desired position.

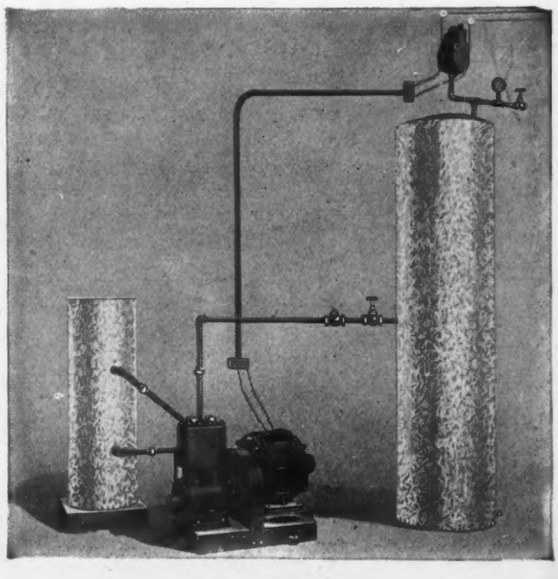


Continental Riveting Jig

This illustration shows the jig, which is bolted to the work bench in use

New Brunner Outfit for Pneumatic Truck Tires

A new outfit has been announced by the Brunner Mfg. Co., Utica, N. Y. It is known as the No. 247 Heavy Duty Outfit and is particularly designed for pneumatic truck tire service. The outfit is furnished complete with the exception of the iron piping necessary for automatic installation. It includes motor-driven compressor, an 80-gallon 200-lb. tank, water cooling tank, automatic controller and the necessary valves and fittings. The compressor is a No. 47. The outfit is adjusted to operate at pressures from 175 to 200 lb.



Replacement Table. Corrected Monthly

Including Piston Ring Sizes, Carburetor Sizes, Brake Lining Sizes and Truck Frame Dimensions

Note: Under Carburetor Inlet Diameter will be found either the size of the main air intake or the gasoline fuel line

Name, Model and Tonnage	ENGINE				BRAKE LINING								FRAME	
	Piston Rings		Carburetor		Service				Emergency				Length	Width
	No. per Cyl.	Width	Outlet Diameter	Inlet Diameter	Length	Width	Thickness	No. of Pieces	Length	Width	Thickness	No. of Pieces	Back of Driver's Seat	Over All
Acason R.	4	1/4	1	.....	11 1/2	3	1/4	2	11 1/2	3	1/4	2	112	34
Acason RB.	4	1/4	1	.....	11 1/2	3 1/2	1/4	2	11 1/2	3 1/2	1/4	2	112	34
Acason H.	3	1/4	1 1/4	.....	13 1/2	3 1/2	1/4	2	13 1/2	3 1/2	1/4	2	130	35
Acason L.	3	1/4	1 1/4	.....	16	3 3/4	1/4	2	16	3 3/4	1/4	2	137	35
Acason M.	3	1/4	1 1/4	.....	18	4 1/2	1/4	2	18	4 1/2	1/4	2	167 1/2	35
Ace, Series A1 1/2	3	1/4	1 1/4	1 1/16	12	3 1/4	1/4	4	12	3 1/4	1/4	4	122 1/2	32
Ace, Series A2 1/2	3	1/4	1 1/4	1 1/16	13 1/2	3 1/4	1/4	4	13 1/2	3 1/4	1/4	4	144 1/2	32
Acme B.	3	1/4	1 1/4	.....	12	3 1/4	1/4	4	12	3 1/4	1/4	4	110 3/8	34
Acme F.	3	1/4	1 1/4	.....	12	3 1/4	1/4	4	12	3 1/4	1/4	4	124 3/8	34
Acme A.	3	1/4	1 1/2	.....	14	3 1/2	1/4	4	14	3 1/2	1/4	4	135 1/2	34
Acme C.	3	1/4	1 1/2	.....	16	3 3/4	1/4	4	16	3 3/4	1/4	4	150 1/2	36
Acme E.	3	1/4	1 1/2	.....	18	4	1/4	4	18	4	1/4	4	160	37
All-American A.	3	1/4	1 1/4	1 1/16	42 1/2	2	1/2	1	39 11/16	2	1/2	1	104	31
Apex C.	3	1/4	1	1 1/4	42	2	.....	1	41 1/2	2	.....	1	102	35 1/2
Apex D.	3	1/4	1	1 1/4	42	2	.....	1	41 1/2	2	.....	1	102	35 1/2
Apex E.	3	1/4	1	1 1/4	54	2 1/4	.....	1	53 1/4	2	.....	1	128	31 1/2
Armleder KW 3 1/2	3	1/4	1 1/4	1/4	42	3	1/4	1	16	3 3/4	1/4	8	150	36
Armleder HW 2 1/2	3	1/4	1 1/4	1/4	13 1/4	3 1/2	1/4	4	13 1/4	3 1/2	1/4	4	140	30
Atterbury 7R.	3	1/4	1 1/4	5/8	13 1/4	3 1/2	1/4	4	13 1/4	3 1/2	1/4	4	115 3/8	34
Atterbury 7CX.	3	1/4	1 1/4	5/8	13 1/4	3 1/2	1/4	4	13 1/4	3 1/2	1/4	4	133 3/8	34
Atterbury 7D.	3	1/4	1 1/4	5/8	15 5/8	3 3/4	1/4	4	15 5/8	3 3/4	1/4	4	145 3/8	37 1/2
Atterbury 8E.	3	1/4	1 1/2	5/8	17 11/16	4	1/4	4	17 11/16	4	1/4	4	157 1/8	37 1/2
Autocar XXI-F	4	1/4	1 1/16	.....	16 1/4	2 1/2	1/2	4	13	2 1/2	1/2	4	91	34
Available H2.	3	1/4	2 1/4	1 1/16	13 1/2	3 1/2	1/4	4	13 1/2	3 1/2	1/4	4	144	75 1/2
Available H2 1/2	3	1/4	2 1/4	1 1/16	13 1/4	3 1/2	1/4	4	13 1/2	3 1/2	1/4	4	144	75 1/2
Available H3.	3	1/4	2 1/2	1 1/16	16	3 3/4	1/4	4	16	3 3/4	1/4	4	168	85 1/4
Available H5.	3	1/4	2 1/2	1 1/16	16	4	1/4	4	16	4	1/4	4	168	89 7/8
Beck-Hawkeye A.	.....	.....	1 1/2	1 1/4	24	2	1/4	1	24	2	1/4	1	114	54
Beck-Hawkeye B.	.....	.....	1 1/2	1 1/4	24	2	1/4	1	24	2	1/4	1	114	66
Beck-Hawkeye C.	.....	.....	1 3/4	1 1/2	25	2 1/4	1/4	1	25	2 1/4	1/4	1	114	66
Beck-Hawkeye D.	3	1/4	1 3/4	1 1/2	25	2 1/4	1/4	1	25	2 1/4	1/4	1	136	72
Belmont A.	.....	.....	1	1 1/2	32	2	1/4	2	31	1 1/2	1/4	2	78	34
Belmont B.	.....	.....	1	1 1/2	41	2	1/4	2	40	1 1/2	1/4	2	120	36
Belmont C.	.....	.....	1	1 3/4	41	2 1/2	1/4	2	40	2	1/4	2	124	36
Bessemer G.	.....	.....	1	1/4	47 1/2	2 1/8	1/4	2	45 1/2	2 1/4	1/4	2	98	34
Bessemer H2.	.....	.....	1	1/4	56 1/2	2 1/2	1/4	2	55	2 1/4	1/4	2	116	34
Bessemer J2.	.....	.....	1 1/4	1/4	56 1/2	2 1/2	1/4	2	55	2 1/4	1/4	2	141	34
Bessemer K2.	.....	.....	1 1/4	1/4	58 1/2	3 1/2	1/4	2	30 1/4	4 1/2	1/4	1	157 1/2	38
Bethlehem D.	3	1/4	1	1/4	43	2 1/2	1/4	2	40 1/8	1 3/4	1/4	2	120	34
Bethlehem E.	3	1/4	1	1/4	51	3	1/4	2	49	2	1/4	2	138	34
Bethlehem F.	4	1/4	1	1/4	55	3	1/4	2	50	2	1/4	2	156	34
Brinton F.	3	1/4	1 1/16	3/4	13	3 1/2	1/4	8	13	3 1/2	1/4	8	135 1/2	33
Briscoe T34	3	.....	1	1 1/4	39	1 3/4	1/4	2	43 11/16	2 1/2	1/4	2	98 1/2	34
Brockway S.	3	1/4	1	.....	20	2	1/4	4	20	2	1/4	4	118	32
Brockway K.	3	1/4	1 1/4	.....	12	3 3/8	1/4	4	12	3 3/8	1/4	4	142	34
BrockwayR.	3	1/4	1 1/4	.....	15 5/8	3 3/4	1/4	4	15 5/8	3 3/4	1/4	4	176	36
Brockway T.	3	3/4	1 1/4	.....	18	4	1/4	4	18	4	1/4	4	176	36
Chicago C1.	4	3 3/4	1	1 1/2	12 1/8	3 1/4	1/4	4	12 1/8	3 1/4	1/4	4	111	32
Chicago C1 1/2	4	3 3/4	1	1 1/2	12 1/8	3 1/4	1/4	4	12 1/8	3 1/4	1/4	4	125	32
Chicago C2 1/2	4	4	1 1/4	1 3/4	13 3/4	3 1/2	1/4	4	13 3/4	3 1/2	1/4	4	135	32
Chicago C3 1/2	4	4 1/2	1 1/4	1 3/4	16	3 3/4	1/4	4	16	3 3/4	1/4	4	180	36 3/4
Clydesdale 120B.	3	1/4	1 11/16	1/4	18	4	1/4	4	18	4	1/4	4	207	38
Clydesdale 90.	3	1/4	1 1/8	1/4	16	3 3/4	1/4	4	16	3 3/4	1/4	4	166 1/2	38
Clydesdale 65X.	3	1/4	1 1/16	1/4	13 1/4	3 1/2	1/4	4	13 1/4	3 1/2	1/4	4	137	33 1/4
Clydesdale 42.	3	1/4	1 1/16	1/4	12	3 1/4	1/4	4	12	3 1/4	1/4	4	117 1/2	34
Clydesdale 32X.	3	1/4	1 1/16	1/4	20	1 3/4	1/4	4	20	1 3/4	1/4	4	117 1/2	34
Columbia G.	.....	.....	1 1/4	.....	55	3	1/4	2	50	2	1/4	2	132	32 1/2
Columbia F.	3	1/4	1	.....	39 1/4	2 1/2	1/4	2	40 1/2	1 3/4	1/4	2	108	32 1/2
Comet.	4	1/4	1	1	17 1/4	2 1/4	1/4	2	17 1/4	1 1/2	1/4	2	100	36
Commerce E 1, 1 1/2.	3	1/4	1	1/4	45	2 1/2	1/4	2	43	2 1/4	1/4	2	92	34
Commerce EP 1 1/2, 2.	3	1/4	1	1/4	45	2 1/2	1/4	2	43	2 1/4	1/4	2	100	34
Concord A.	.....	.....	1 1/4	1/4	13 1/2	3 1/2	1/4	4	13 1/2	3 1/2	1/4	4	110 1/4	32 1/16
Concord B.	.....	.....	1 1/4	1/4	13 1/2	3 1/2	1/4	4	13 1/2	3 1/2	1/4	4	124 5/8	32 1/16
Conestoga 12.	3	1/4	1	1/4	39	2	1/4	1	39	2	1/4	1	86	34
Conestoga 20.	3	1/4	1	1/4	22	2 1/2	1/4	2	14	2 1/2	1/4	2	96	32
Conestoga 30.	3	1/4	1	1/4	22	2 1/2	1/4	2	14	2 1/2	1/4	2	120	32
Corbitt E.	3	1/4	1	1/4	19	2	1/4	2	19	2	1/4	2	105	34
Corbitt D.	3	1/4	1 1/4	1/4	45 1/4	2	1/4	1	35 1/4	2	1/4	1	120	34
Corbitt C.	3	1/4	1 1/4	1/4	51 1/2	2 1/4	1/4	1	51 1/2	2 1/4	1/4	1	138	35
Corbitt B.	3	1/4	1 1/4	1/4	51 1/2	2 1/4	1/4	1	51 1/2	2 1/4	1/4	1	138	35
Corbitt AA.	3	1/4	1 1/2	1/4	69 1/4	3	1/4	1	69 1/4	3	1/4	1	160	38
Corbitt A.	3	1/4	1 1/4	1/4	64	2 1/2	1/4	1	64	2 1/2	1/4	1	160	35
Couple Gear HC, AC, LO.	.....	.....	2	1 3/4	48	3	1/4	2	.....	.....	.....	.....	168	42
Dart H.	3	1/4	1 1/4	1 1/16	19	1 3/4	1/4	4	19	1 3/4	1/4	4	102	34
Dart S.	3	1/4	1 1/4	1 1/16	19	1 3/4	1/4	4	19	1 3/4	1/4	4	112	34
Dart M.	3	1/4	1 1/4	1 1/16	10	2 1/2	1/4	2	19	3 1/2	1/4	4	124	34
Dart W.	3	1/4	1 1/4	1 1/16	28	2 3/4	1/4	4	28	2 3/4	1/4	4	144	38
Day-Elder A.	3	1/4	1 1/16	1 1/16	47	2 1/2	1/4	1	33 1/2	2 1/2	1/4	1	103	35
Day-Elder B.	3	1/4	1 1/16	1 1/16	47	2 1/2	1/4	1	33 1/2	2 1/2	1/4	1	120	35
Day-Elder D.	3	1/4	1 1/16	1 1/16	48	2 1/2	1/4	1	33	2 1/2	1/4	1	151 3/4	35
Day-Elder C.	3	1/4	1 1/16	1 1/16	57	2 1/2	1/4	1	43	2 1/2	1/4	1	151 1/4	35
Day-Elder F.	3	1/4	1 1/16	2	57	2 1/2	1/4	1	43	2 1/2	1/4	1	145	35
Day-Elder E.	3	1/4	1 1/16	2	68	3	1/4	4	68	3	1/4	4	155	37
Dearborn BW.	3	.....	1	.....	16 1/2	2 1/2	1/4	2	16 1/2	2 1/2	1/4	2	112	32
Dearborn F.	3	1/4	1	.....	16 1/2	2 1/2	1/4	2	16 1/2	1 1/2	1/4	2	93	36
Dearborn C.	.....	.....	1	3/4	38	2	1/4	1	38	2	1/4	1	107	32
Defiance B.	3	1/4	1	.....	45	2 1/2	1/4	1	43 1/16	2 1/4	1/4	1	116	34
Defiance C.	3	1/4	1	.....	54 1/16	2 1/2	1/4	1	52 1/2	2 1/4	1/4	1	116	34
De Kalb E2.	3	1/4	1 1/4	1 1/4	28	3 1/2	1/4	1	28	3 1/2	1/4	1	120	30
De Kalb E2 1/2.	3	1/4	1 1/4	1 1/4	28	3 1/2	1/4	1	28	3 1/2	1/4	1	132	32
Denby 12.	3	1/4	1	.....	43 1/2	2 1/2	1/4	1	39 1/2	1 3/4	1/4	1	95	34
Denby 134.	3	1/4	1	.....	51 1/4	2 1/2	1/4	1	47	2	1/4	1	129	34
Denby 25.	3	1/4	1 1/4	.....	55 3/4	3	1/4	1	51	2	1/4	1	142	34
Denby 27.	3	1/4	1 1/4	.....	61 1/2	3	1/4	1	58	2 1/2	1/4	1	186	34
Denby 210.	3	1/4	1 1/4	.....	89	2 1/4	1/4	1	89	2 1/4	1/4	1	186	34
Dependable C.	.....	.....	.....	.....	53 1/2	2 1/2	1/4	1	39 1/4	2 1/2	1/4	1	121	33
Dependable E.	.....	.....	.....	.....	62 7/8	2 1/2	1/4	1	48	2 1/2	1/4	1	152	33
Diamond T-J5.	3	1/4	1	1 1/4	12 1/2	3 1/4	1/4	8	12 1/2	3 1/4	1/4	8	97 1/4	34
Diamond T-J4.	3	1/4	1	1 1/4	13 1/4	3 1/2	1/4	8	13 1/4	3 1/2	1/4	8	128 1/4	34
Diamond T-J3.	3	1/4	1 1/4	1 1/2	13 1/4	3 1/2	1/4	8	13 1/4	3 1/2	1/4	8	129 1/2	34
Diamond T-LB.	3	1/4	1 1/4	1 1/2	16	3 3/4	1/4	8	16	3 3/4	1/4	8	142 1/2	37
Diamond T-R.	3	1/4	1 1/4	1 1/2	18 1/2	4	1/4	8	18 1/2	4	1/4	8	154 1/2	37

Replacement Table—Continued

Name, Model and Tonnage	ENGINE				BRAKE LINING								FRAME	
	Piston Rings		Carburetor		Service				Emergency				Length	Width
	No. per cyl.	Width	Outlet Diameter	Inlet Diameter	Length	Width	Thickness	No. of Pieces	Length	Width	Thickness	No. of Pieces	Back of Driver's Seat	Over All
Diamond T-S	3	1/8	1 1/4	1 3/4	18 1/2	4	1/4	8	18 1/2	4	1/4	8	156 3/8	37
Diamond T-FS&T	3	1/8	1	1 1/4	13 1/4	3 1/2	1/4	8	13 1/4	3 1/2	1/4	8	123 1/4	34
Diehl A	3	....	1	1	28	2 1/2	1/8	2	27	2	1/8	2	90	.....
Doane 2½	3	1/4	1 1/4	1/8	34 1/2	3	1/4	2	34	3	1/8	4	126	53
Doane 6	3	....	1 1/2	1/8	37 1/2	3	1/4	2	46	4	1/8	4	168	64
Dodge	3	1/8	1	1/8	19 1/4	2 1/2	1/8	2	14 3/4	1 3/4	1/8	2	47 3/8	38
Dorris K4	3	1/4	1 1/4	1 1/4	13 1/2	3 1/2	1/4	4	13 1/2	3 1/2	1/4	4	142 3/4	34
Dorris K7	3	1/4	1 1/4	1 1/4	15 3/4	3 3/4	1/4	4	15 3/4	3 3/4	1/4	4	179 1/2	36
Douglas 1	....	....	1 1/4	1/4	3	2	1/4	2	42	2	1/4	2	101	31 1/2
Douglas 1½	....	....	1 1/4	1/4	3	2	1/4	2	42	2	1/4	2	117	31 1/2
Douglas 2½	....	....	1 1/4	1/4	4	2 1/2	1/4	2	54	2 1/2	1/4	2	133	31 1/2
Duplex E	3	1/4	1 1/4	1	9 1/2	2 1/2	1/4	2	5 1/2	2 1/2	1/4	2	126	39 3/8
Ellsworth 25A	3	1/8	1 1/4	1 1/4	12	1 1/4	1/4	4	12	1 1/4	1/4	4	Opt	36
Fageol 1½	....	....	1 1/4	1 1/2	19 1/4	1 3/4	1/8	2	19 1/4	1 3/4	1/8	2	120	30
Fageol 2½	3	1/4	1 1/8	1 11/16	13 1/4	3 1/2	1/4	2	13 1/4	3 1/4	1/4	2	135	34
Fageol 4500	3	1/4	1 5/8	2	15 1/2	3 3/4	1/8	2	15 1/2	3 3/4	1/8	2	161 1/4	37 3/4
Fageol 5300	3	1/4	1 5/8	2	18	4	1/8	2	18	4	1/8	2	161 1/4	37 3/4
Famous B10	3	1/8	1	1/8	21	2 3/4	1/4	1	48	2	1/8	2	94	34
Famous B12	3	1/8	1	1/8	21	2 1/2	1/4	1	48	2	1/8	2	94	34
Fargo O17, P18, P19, P20	3	1/8	.....	1 1/8	52	3	1/8	2	50 1/2	2	1/8	2	132	33
Federal SD	4	1/8	1	1 1/16	10 11/16	3	1/4	4	10 11/16	3	1/4	4	112	34
Federal TE	3	1/8	1 1/4	1 1/2	13 1/16	3 1/2	1/4	4	13 1/16	3 1/2	1/4	4	120	34
Federal UE	3	1/8	1 1/4	1 1/2	13 1/16	3 1/2	1/4	4	13 1/16	3 1/2	1/4	4	136	34
Federal WD	3	1/8	1 1/4	1 1/2	15 5/8	3 3/4	1/4	4	15 5/8	3 3/4	1/4	4	156	38
Federal XC	3	1/8	1 1/4	1 1/2	17 11/16	4	1/4	4	17 11/16	4	1/4	4	156	38
Federal Light Duty	3	1/8	1 1/4	1 1/2	13 1/16	3 1/2	1/4	4	13 1/16	3 1/2	1/4	4	88	34
Federal Heavy Duty	3	1/8	1 1/4	1 1/2	15 5/8	3 3/4	1/4	4	15 5/8	3 3/4	1/4	4	84	38
Ford T	3	1/4	1 1/8	1 1/16	23 3/8	1 1/16	11/32	1	12	1 5/8	1/8	2	123 21/32	32
F.W.D. B	3	1/4	1 1/2	1/8	27	3 1/2	1/4	1	43	2 3/4	1/4	2	136	36
Gabriel E	3	1/4	2 1/4	1 3/4	....	3 1/4	1/4	4	13	3 1/4	1/4	4	144	33
Gabriel F	....	....	2 1/2	1 3/4	....	3 3/4	1/4	4	16	3 3/4	1/4	4	144	37
Garford 25	3	1/8	1	.....	11 3/4	3 1/4	1/4	4	11 3/4	3 1/4	1/4	4	103	34
Garford 70B	3	1/4	1 1/4	.....	13 1/16	3 1/2	1/4	4	13 1/16	3 1/2	1/4	4	121	34
Garford 77D	3	1/4	1 1/4	.....	15 5/8	3 3/4	1/4	4	15 5/8	3 3/4	1/4	4	144	36
Garford 77C	3	1/4	1 1/4	.....	15 5/8	3 3/4	1/4	4	15 5/8	3 3/4	1/4	4	150	32
Garford 68	3	1/4	1 1/4	.....	10 1/2	4	3/8	2	21 5/8	4	1/4	4	150	32
Gary F	3	1/4	1	3/8	22 1/2	3	1/4	2	22 1/2	3	1/4	2	114	34
Gary GT	3	1/4	1 1/4	3/8	24	3 1/4	1/4	2	24	3 1/4	1/4	2	120	34
Gary J	3	1/4	1 1/4	3/8	27	3 1/2	1/4	2	27	3 1/2	1/4	2	120	34
Gary KT	3	1/4	1 1/4	3/8	32	3 3/4	1/4	2	32	3 3/4	1/4	2	148	36 3/4
Gary M	....	....	1 1/2	3/8	36 1/2	4	1/4	2	36 1/2	4	1/4	2	168	39
Gersix K	3	1/4	1 1/4	1 1/2	20	2 1/2	1/4	4	47	2 1/4	1/4	2	131	34
Gersix M	3	1/4	1 1/4	1 1/2	46	2	1/4	2	46	2	1/4	2	114	32
Giant 14	3	1/8	1	.....	19	2	1/8	4	19	2	1/8	4	116 1/2	33
Giant 15	3	1/8	1	.....	19	2	1/8	4	19	2	1/8	4	116 1/2	32
Giant 16	3	1/8	1 1/4	.....	45 1/2	2	1/8	2	45 1/2	2	1/8	2	140 1/2	33
Giant 17	3	1/8	1 1/2	.....	56 1/2	2 1/2	1/4	2	46 1/2	2 1/2	1/4	2	183 1/2	36
G.M.C. 16	3	1/8	1	1	40 13/16	1 1/8	1/8	2	43 1/8	1 1/8	1/8	2	92 1/2	34
G.M.C. 31A	3	1/8	1	1	13 1/8	3 1/2	1/4	4	13 1/8	3 1/2	1/4	4	101	33
G.M.C. 31B	3	1/8	1	1	13 1/8	3 1/2	1/4	4	13 1/8	3 1/2	1/4	4	125	33
G.M.C. 41A	3	1/8	1	1	13 1/8	3 1/2	1/4	4	13 1/8	3 1/2	1/4	4	125 3/8	33
G.M.C. 41B	3	1/8	1	1	13 1/8	3 1/2	1/4	4	13 1/8	3 1/2	1/4	4	149 3/4	33
G.M.C. 71A	3	1/8	1 1/4	1 1/4	15 5/8	3 3/4	1/4	4	15 5/8	3 3/4	1/4	4	144	38
G.M.C. 71B	3	1/8	1 1/4	1 1/4	15 5/8	3 3/4	1/4	4	15 5/8	3 3/4	1/4	4	192	38
G.M.C. 101A	3	1/8	1 1/4	1 1/4	17 11/16	4	1/4	4	17 11/16	4	1/4	4	144	38
G.M.C. 101B	3	1/8	1 1/4	1 1/4	17 11/16	4	1/4	4	17 11/16	4	1/4	4	192	38
Gramm-Bernstein 15	3	1/8	1	.....	50	2	....	1	50	2	....	1	120	32
Gramm-Bernstein 65	3	1/8	1	.....	49	1 3/4	....	1	49	1 3/4	....	1	120	32
Gramm-Bernstein 20	3	1/8	1 1/4	.....	50	2	....	1	50	2	....	1	126	32 1/8
Gramm-Bernstein 25	3	1/4	1 1/4	.....	56 1/2	3 1/2	....	1	....	....	....	1	130	36
Gramm-Bernstein 35	3	1/4	1 1/4	.....	66	2 3/4	....	1	66	2 3/4	....	1	144	36
Gramm-Bernstein 50	3	1/4	1 1/2	.....	75 1/2	3 3/4	....	1	75 1/2	2 3/4	....	1	162	36
Grant 10	3	1/4	1 1/8	.....	45	2 1/2	1/8	2	43 1/8	2 1/4	1/8	2	107	35 1/8
Grant 11	3	1/4	1 1/8	.....	45	2 1/2	1/8	2	43 1/8	2 1/4	1/8	2	134 1/2	35 1/8
Grant 15	3	1/4	1 1/8	.....	54 1/8	2 1/2	1/8	2	52 1/8	2 1/4	1/8	2	107	35 1/8
Grant 16	3	1/4	1 1/8	.....	54 1/8	2 1/2	1/8	2	52 1/8	2 1/4	1/8	2	134 1/4	35 1/8
Hall 2-Worm	....	....	....	....	13 1/2	3 1/2	1/4	2	13 1/2	3 1/2	1/4	2	144	38
Hall 3½-Worm	3	1/8	.....	.....	16	3 3/4	1/4	2	16	3 3/4	1/4	2	180	39
Hall 5-Worm	....	....	.....	.....	18 1/2	4	1/4	2	18 1/2	4	1/4	2	144	39
Hall 5-7-Chain	....	....	.....	.....	37	2 1/2	1/8	1	59	4	1/4	1	180	39
Harvey WEA	4	1/4	.....	.....	46	2	1/4	2	46	2	1/4	2	120	32
Harvey WFA	4	1/4	.....	.....	52	2 1/4	1/4	2	52	2 1/4	1/4	2	126 1/2	32
Harvey WHA	4	1/4	.....	.....	56	2 1/2	1/4	2	56	2 1/2	1/4	2	144	35
Harvey WKA	4	1/4	.....	.....	69	3	1/8	2	69	3	1/8	2	144	35
Hawkeye K	....	....	1 1/4	.....	48	2	1/8	2	47	1 1/2	1/8	2	112	34
Hawkeye M	....	....	1 1/4	.....	54	2 1/2	1/8	2	52	2	1/8	2	112	34
Hendrickson I	3	1/4	1 1/4	1/8	12	3 1/2	1/8	4	12	3 1/2	1/8	4	Opt	32 1/2
Hendrickson J	3	1/4	1 1/4	1/8	16	3 3/4	1/8	4	16	3 3/4	1/8	4	Opt	36
Hendrickson K	3	1/4	1 1/2	1/8	18	4	1/8	4	18	4	1/8	4	Opt	38
Highway-Knight A	....	....	1 1/2	.....	57	2 1/2	1/4	1	57	2 1/2	1/4	1	150	38
Highway-Knight B	....	....	1 1/2	.....	69	3	1/4	1	69	3	1/4	1	150	38
Higrade A18	....	....	1	1	12	1 1/2	1/4	2	12	1 1/2	1/4	2	85	32
Higrade B20	....	....	1 1/8	1 1/8	18	2	1/4	2	18	2	1/4	2	102	32
Hood C	3	1/4	1	1/4	23	1	1/8	1	23	2 1/2	1/8	2	30	23
Hoover 15B	3	1/8	1	1 3/4	16	1 3/4	1/8	2	16	1 3/4	1/8	2	82	35 1/2
Hoover 20A	3	1/8	1	1 3/4	19	2	1/8	2	19	2	1/8	2	105	33
Huffman B	3	1/8	1	1/8	44	2 1/4	1/8	2	44	1 1/2	1/8	2	123	32
Huffman C	3	1/8	1	1/8	46	2 1/2	1/8	2	44	2 1/4	1/8	2	123	32
Hurlburt A1½-2	3	....	1 1/4	1	22	2	1/4	2	22	2	1/4	2	132	35 1/2
Hurlburt B2½	3	1/8	1 1/4	1	24	2 1/2	1/4	2	23	2 1/2	1/4	2	154	34
Hurlburt C3½-4	3	1/4	1 1/2	1 1/4	26	3	1/4	2	25	3	1/4	2	144 1/2	34
Hurlburt D5-5½	3	1/4	1 1/2	1 1/4	28	3	1/4	2	27	3	1/4	2	144 1/2	34
Indiana 12	3	1/4	1	.....	17 1/2	2	1/8	8	17 1/2	2	1/8	8	108	32
Indiana 20	3	1/4	1 1/4	.....	44	2	1/4	4	44	2	1/4	4	126	33
Indiana 25	3	1/4	1 1/4	.....	51	2 1/4	1/4	4	51	2 1/4	1/4	4	138	33
Indiana 35	3	1/4	1 1/4	.....	56	2 1/4	1/4	4	56	2 1/2	1/4	4	144	34 1/2
Indiana 50	3	1/4	1 1/4	.....	68	3	1/4	4	68	3	1/4	4	156	37 1/2
International H	3	1/8	1.7	1 1/4	43 3/4	2 1/4	1/8	2	43 3/4	2 1/4	1/8	2	67 7/8	34
International F	3	1/8	1.7	1 1/4	43 3/4	2 1/4	1/8	2	43 3/4	2 1/4	1/8	2	88 3/4	34
International K	3	1/8	1.7	1 1/4	50 5/8	2 1/4	1/8	2	50 5/8	2 1/4	1/8	2	92 11/16	34
International G	4	1/4	1.7	1 1/4	50 5/8	2 1/4	1/8	2	50 5/8	2 1/4	1/8	2	99 1/8	34
International L	4	1/4	1.7	1 1/4	74 11/16	2 1/2	1/8	2	74 11/16	2 1/2	1/8	2	169	34
Jones 31A	3	1/8	1	1/8	41 11/16	2 1/2	1/4	2	39 1/4	1 3/4	1/4	2	100 1/2	36
Jumbo O	3	1/4	1 1/4	.....	51 1/4	3	1/8	1	48 3/4	2 1/2	1/8	1	116	34
Jumbo E	3	1/4	1 1/4	.....	51 1/4	3	1/8	1	48 3/4	2 1/2	1/8	1	159	34
Jumbo C	3	1/4	1 1/4	.....	51 1/4	3	1/8	1	48 3/4	2 1/2	1/8	1	72	34
Kalamazoo G	3	1/4	1 1/8	.....	50	2 1/2	1/8	1	....	2 1/2	1/8	1	126	32 1/2
Kalamazoo H	3	1/4	2 1/8	.....	90	2 1/2	1/8	1	48	2 1/2	1/8	1	148	33
Kalamazoo K	3	1/4	2 1/8	.....	60	2 1/2	1/8	1	60	2 1/2	1/8	1	151	36
Kankankee E	3	1/4	1 1/8	1 1/4	51	3	1/8	2	50	2	1/8	2	148	32
Keldon 19	4	1/8	1 1/4	1 1/4	48	3	1/8	1	45	3	1/8	1	132	34
Kelly-Springfield K31	3	1/4	1	1/8	16 3/4	1 7/8	1/8	4	16 3/4	1 7/8	1/8	4	141	34
Kelly-Springfield K32	3	1/4	1	1/8	17 3/8	1 7/8	1/8	4	17 3/8	1 7/8	1/8	4	141	34
Kelly-Springfield K35	3	1/4	1	1/8	16 3/4	1 7/8	1/8	4	16 3/4	1 7/8	1/8	4	141	34
Kelly-Springfield K36	3	1/4	1	1/8	17 3/8	1 7/8	1/8	4	17 3/8	1 7/8	1/8	4	141	34
Kelly-Springfield K40	3	1/4	1 1/2	1/8	21	2 7/8	1/8	4	21	2 3/8	1/8	4	145	38
Kelly-Springfield K45	3	1/4	1 1/2	1/8	21	2 7/8	1/8	4	21	2 3/8	1/8	4	145	38
Kelly-Springfield K50	3	1/4	1 1/2	1/8	21	2 7/8	1/8	4	21	2 3/8	1/8	4	145	38
Kelly-Springfield K60	3	1/4	1 1/2	1/8	21	2 7/8	1/8	4	21	2 3/8	1/8	4	145	83
Keystone 40	....	....	1	.....	50 1/2	3	1/8	1	46 3/4	2	1/8	1	124	33
Kimball	....	....	1 1/4	.....	50	2 1/4	1/4	4	33	3 1/2	1/4	..	135	34
Kimball	....	....	1 1/4	.....	52	2 1/2	1/4	4	33	3 1/2	1/4	...	152	34
Kimball	....	....	1 1/2	.....	52	2 1/2	1/4	4	33	3 1/2	1/4	...	152	34
Kimball	....	....	1 1/2	.....	58	3	1/4	2	58	3	1/4	...	171	36
Kimball	....	....	1 1/2	.....	65	3	1/4	2	65	3	1/4	...	171	36
King-Zeitler 1½	3	1/8	1	1 1/4	48	3 1/4	1/4	4	48	3 1/4	1/4	4	Opt	32
King-Zeitler 2	3	1/8	1	1 1/4	54	3 1/2	1/4	4	54	3 1/2	1/4	4	Opt	32
King-Zeitler 3½	3	1/8	1	1 1/4	63	3 3/4	1/4	4	63	3 3/4	1/4	4	Opt	36
Kissel-Delivery	3	1/8	.....	1 1/4	44 1/4	2	1/8	2	44 1/4	2	1/8	2	96	33 1/2
Kissel-Utility	3	1/8	.....	1 1/4	19	2	1/8	4	19	2	1/8	4	120	34
Kissel-Freighter	3	1/8	.....	1 1/4	13 1/2	3 1/2	1/4	4	13 1/2	3 1/2	1/4	4	144	34
Kissel-Heavy-Duty	3	1/8	.....	1 1/4	56	2 1/2	1/8	2	56	2 1/2	1/8	2	156	36
Kissel-Goliath	3	1/8	.....	1 1/4	56	2 1/2	1/8	2	56	2 1/2	1/8	2	168	36
Kleiber 1	....	....	1 1/4	1 1/4	....	....	....	....	....	....	....	....	120	34

Name, Model and Tonnage	ENGINE				BRAKE LINING								FRAME	
	Piston Rings		Carburetor		Service				Emergency				Length	Width
	No. per cyl.	Width	Outlet Diameter	Inlet Diameter	Length	Width	Thickness	No. of Pieces	Length	Width	Thickness	No. of Pieces	Back of Driver's Seat	Over All
Kleiber 1½			1¼	1¾									132	34
Kleiber 2			1¼	1¾									144	34
Kleiber 2½			1¼	1¾									150	34
Kleiber 3½			1¼	1¾									156	34
Kleiber 5			1½	1¾									168	38
Knox 35	4	1/4	1½			4		2	57¾	6½	1/4	1	27 1/16	28
Knox 36	4	1/4	1½			4		3	57¾	6½	1/4	1	96 1/8	28
Koehler M 2½	4	1/16	1¼	1/16	13½	3½	1/4	4	13½	3½	1/4	4	144	34
Koehler C 1¼	3	1/16	1	1/4	47	2½	1/16	2	46	2¼	1/16	2	108	34
Lange	3				30	2	1/4	2	18	3	1/4	4	114	37
Larrabee-Deyo U	3	1/16	1¼		48	2	1/4	2	48	2	1/4	2	108	34
Larrabee-Deyo A, B & L	3	1/16	1¼		60	2½	1/4	2	60	2½	1/4	2	132	36
Larrabee-Deyo C, D & K	3	1/16	1¼		54	2¼	1/4	2	54	2¼	1/4	2	132	36
Larrabee-Deyo W	3	1/16	1½		72	3	1/4	2	72	3	1/4	2	160	36
Larrabee-Deyo T	3	1/16	1¼		72	3	1/4	2	72	3	1/4	2	162	36
L. M. C			1 1/16	1 5/16	55	3	1/16	2	50½	2	1/16	2	143	32
Lombard													120	72
Luedinghaus			1¼	1 11/16	40	2¼	1/4	2	40	1½	1/4	2	120	34
Luverne BBL	3	1/16	1¼	1¼		2½	1/4	2		2½	1/4	2	108	34
Maccar L	3	1/16	1¼	5/8	11 3/4	3¼	1/4	4	48	3½	1/4	4	128 1/16	34
Maccar H	3	1/16	1¼	5/8	13¼	3½	1/4	4	52	3½	1/4	4	143 5/8	34
Maccar M	3	1/16	1¼	5/8	15 5/8	3¾	1/4	4	64	3¾	1/4	4	157 5/8	34
Maccar G	3	1/4	1½	5/8	18	4	1/4	4	72	4	1/4	4	167	37½
Mack AB 1½, 2 Ton-Chain	3	4	1¼	1/4	12¼	4	1/4	2	16½	2½	1/4	4	Opt	33¼
Mack AB 1½, 2 Ton-Worm	3	4	1¼	1/4	13 1/16	3½	1/4	4	13 1/16	3½	1/4	4	Opt	33¼
Mack AB-Tractor 5 Ton	3	4	1¼	1/4	12¼	4	1/4	2	16½	2½	1/4	4	77	33¼
Mack AC 3½, 5, 6½, 7½ Ton	4	5	1½	1/4	16½	3	1/4	4	20½	3½	1/4	4	Opt	37½
Mack AC Tractor 7, 10, 13, 15Ton	4	5	1½	1/4	16½	3	1/4	4	20½	3½	1/4	4	87	37½
Master J1	3	1/16	1¼	2	74½	2½	1/8	1	74½	2¼	1/4	1	120	34
Master JW	3	1/16	1¼	2	12	3¼	1/4	2	12	3¼	1/4	2	120	34
Master M	3	1/4	1¼	2	74½	2½	1/8	1	74½	2¼	1/4	1	120	34
Master O	3	1/4	1¼	2	74½	2½	1/8	1	74½	2¼	1/4	1	159	34
Master W	3	1/4	1¼	2	13¼	3½	1/4	2	13¼	3½	1/4	2	120	34
Master WL	3	1/4	1¼	2	13¼	3½	1/4	2	13¼	3½	1/4	2	159	34
Master T	3	1/4	1¼	2	74½	2½	1/8	1	74½	2¼	1/4	1	74¾	34
Master A	4	1/4	1½	1¾	16	3¾	1/4	2	16	3¾	1/4	2	150	36¾
Master AL	4	1/4	1½	1¾	16	3¾	1/4	2	16	3¾	1/4	2	186	36¾
Master B	4	1/4	1½	1¾	18	4	1/4	2	18	4	1/4	2	168	39
Master BL	4	1/4	1½	1¾	18	4	1/4	2	18	4	1/4	2	192	39
Maxwell 1½	3	1/16	1	1	16	1¾	1/16	2	16	1¾	1/16	2	102	36 1/16
Menominee HT	3	1/16	1	1½	12	3¼	1/4	8						32
Menominee H	3	1/16	1¼	1¾	13½	3½	1/4	8						32
Menominee D	3	1/16	1¼	1¾	13½	3½	1/4	8						32
Menominee G	3	1/4	1½	2	16	3½	1/4	8						36
Menominee J	3	1/16	1½	2	18½	4	1/4	8						38
Moreland 19B	3	1/16	1¼	1¾	12	3½	1/4	4	12	3½	1/4	4	132	34
Moreland 19C	3	1/16	1½	1¾	13½	3½	1/4	4	13½	3½	1/4	4	156	34
Moreland 19G	3	1/4	1½	1¾	16	3¾	1/4	4	16	3¾	1/4	4	168	38
Moreland 19J	3	1/4	1½	1¾	18	4	1/4	4	18	4	1/4	4	168	38
Muskegon 20	3	1/16	1¼	2	54	2½	1/16	2	53	2¼	1/16	2	119½	34
Mutual				1¼	52	2¼	1/4	2	52	2¼	1/4	2	129 5/8	34
Myers 60	3	1/16	1½	1½	44	2	2¼	2	44	2	2¼	2	102	34
Myers 80	3	1/16	1½	1½	44	2	2¼	2	44	2	2¼	2	112	34
Napoleon 9	3	1/4	1	1/16	44	2	1/16	1	30	2½	1/16	1	102	35
Napoleon 11	3	1/4	1	1/16	49	2	1/16	1	30	2½	1/16	1	102	35
Nash 2018	4	1/4	1¼	1¼	49 1/16	2	1/16	2	20 1/16	2½	1/16	1	104½	30½
Nash 3018	4	1/4	1¼	1½	50 5/8	3	1/16	2	20 1/16	2½	1/16	1	118¼	31 5/8
Nash 4017	3	1/4	1¼	1¼	49¼	2½	1/4	4	25 1/16	2½	1/4	1	117⅜	38⅛
Nelson & LeMoon F1	3	1/16	1¼	1/16	12	3¼	1/4	2	12	3¼	1/4	2	Opt	
Nelson & LeMoon F1½	3	1/16	1¼	1/16	12	3¼	1/4	2	12	3¼	1/4	2	Opt	
Nelson & LeMoon F2	3	1/16	1¼	1/16	12	3¼	1/4	2	12	3¼	1/4	2	Opt	
Nelson & LeMoon F3½	3	1/4	1¼	1/16	16½	3¾	1/4	2	16½	3¾	1/4	2	Opt	
Nelson & LeMoon F5	4	1/4	1½	1/16	18	4	1/4	2	18	4	1/4	2	Opt	
Netco D	3	1/16	1¼	1 1/16	13	3½	1/4	4	13	3½	1/4	4	116	34
Netco H	3	1/16	1½	1 1/16	13	3½	1/4	4	13	3½	1/4	4	144	34
Niles E			1¾	1¾	12	3¾	1/4	2	12	3¾	1/4	2	114	
Noble A20			1										124	34
Noble B30			1										136	34
Noble C40			1¼										148	34
Noble D50			1¼										172	34
Noble E70			1¼										172	36
Northway B2			1 1/16	1¾	50½	2¼	1/4	2	50½	2¼	1/4	2	118	33
Northway B3			1 1/16	1¾	54	2½	1/4	2	54	2½	1/4	2	148	34 5/8
O. K	3	1/16	1¼		43	2½	1/16	1	58	2½	1/16	1	125	35
O. K	3	1/16	1¼		43	2½	3/4	1	58	2½	1/16	1	125	35
Old Hickory W	3	1/16	1 3/8	1	24	2¼	1/4	2	24	2¼	1/4	2	120	36
Old Reliable A	3	1/4	1¼	1¼	48	2½	1/4	1	48	2½	1/4	1	105	32
Old Reliable B	3	1/4	1¼	1¼	54	2	1/4	1	54	2	1/4	1	144	32
Old Reliable C	3	1/4	1¼	1¼	60	2½	1/4	1	60	2½	1/4	1	150	32
Old Reliable D	3	1/4	1½	1½	72	2½	1/4	1	72	2½	1/4	1	156	34
Old Reliable K, L, M	3	1/4	1½	1½	54	3½	1/4	1	60	4	1/4	1	107	36
Oldsmobile T	3	3 11/16	1	1/16	42¼	2	1/4	1	41 1/16	2	1/16	1	92 5/8	34
Oneida A 9	3	1/16			12	3¼	1/4	4					130	34
Oneida B 9	3	1/4			12½	3½	1/4	4					130	34
Oneida C 9	3	1/16			12½	3½	1/4	4					146	34
Oneida D 9	3	1/16			15 5/8	3¾	1/4	4					162	36
Oneida E 9	3	1/16			18	4	1/4	4					204	38
Oshkosh A	3	1/16	1¼	2	23 5/8	3	1/4	1	43 1/16	2½	1/16	2	108 5/8	34
Oshkosh AA	3	1/16	1¼	2	23 5/8	3	1/4	1	43 1/16	2½	1/16	2	143 5/8	34
Packard 1½E	3	1/4	1 5/8	1¾	7 11/16	4¾	1/4	2	14	2	1/16	2	126	31¾
Packard 2E	3	1/4	1 5/8	1¾	7 11/16	4¾	1/4	2	14	2	1/16	2	132	31¾
Packard 3E	3	1/4	1 5/8	1¾	9 1/16	4¾	1/4	2	17	3	1/16	2	144	39
Packard 4E	3	1/4	1 5/8	1¾	9 1/16	4¾	1/4	2	18¾	3	1/16	2	144	39
Packard 5E	3	1/4	1 5/8	1¾	9 1/16	6½	1/4	2	18¾	3½	1/16	2	144	39
Packard 6E	3	1/4	1 5/8	1¾	9 1/16	6½	1/4	2	18¾	3½	1/16	2	144	39
Paige 50-18	3	1/16			13¼	3½	1/4	4	13¼	3½	1/4	4	126	33
Paige 51-18	3	1/16			13¼	3¾	1/4	4	13¼	3¾	1/4	4	144	35
Paige 52-19	3	1/16											126	33
Parker F9	3	1/4	1¼		10¾	5	1/4	2	17	2½	1/4	4	127	33
Parker J9	3		1¼		10¾	5	1/4	2	17½	3½	1/4	4	139½	33
Parker M9	3	1/4	1½		10¾	5	1/4	2	18	4	1/4	8	145	37
Patriot Lincoln	3	1/16	1 1/16	1 11/16	41	1¾	1/4	2	41	1¾	1/4	2	109	34
Patriot Revere	3		1 1/16	1 1/16	41	1¾	1/4	2	41	1¾	1/4	2	92½	33¼
Patriot Washington	3	1/16	1 1/16	1 11/16	55	2¼	1/4	2	55	2¼	1/4	2	113¾	34
Piedmont 4-30			1	1/16	20	2½	1/16	2	16	2¼	1/16	2	100	36
Pierce-Arrow 5	3	1/16	1½	1¾	7¼	3½	1/4	2	18	4	1/4	4	144 1/16	38 1/16
Pierce-Arrow 2	4	1/4	1 3/16	1¾	8 1/16	5	1/16	2	18 11/16	3	1/16	4	126 1/16	34 1/16
Pittsburgher 2½	3	1/4	1¼	1¼	44	2¼	1/4	2	44	2¼	1/4	2	136	33
Pony ¼	3	1/16	1	3/8					10	1½	1/8	2	40	24
Rainier R6	3	1/16	1 1/16	1/16	19	2	1/16	2	19	2	1/16	2	96 1/8	34
Rainier R9	3	1/16	1 1/16	1/16	44½	2	1/4	1	44½	2	1/4	1	124	34
Rainier R11	3	1/16	1 1/16	1/16	11¾	3	1/16	2	11¾	3	1/16	2	87¾	34
Reliance A10	3	1/4	1¼	3/8	15	2	1/16	4	15	2	1/16	4	122	32
Reliance B20	3	1/4	1¼	3/8	15	2	1/16	4	15	2	1/16	4	127	32
Reo F	3	1/16	1	1	43	2¼	1/16	1	38 11/16	2	1/16	1	84	30
Republic 10	3	1/16	1		45	2½	1/16	2	43	2¼	1/16	2	98½	34
Republic 11X	3	1/16	1		54¾	2¼	1/16	2	52½	2¼	1/16	2	118½	34
Republic 19	3	1/16	1¼		54¾	2¼	1/16	2	52½	2¼	1/16	2	120¾	34
Republic 20	3	1/4	1¼		56½	3½	1/16	2	31	4½	1/16	1	146	37
Reynolds 3A	3	4	1¼		46	2	1/4	2	46	2	1/4	2	117½	33
Reynolds 5A	3	4½	1¼		52½	2¼	1/4	2	52½	2¼	1/4	2	120½	33
Reynolds 7A	3	4½	1¼		57	2½	1/4	2	57	2½	1/4	2		37
Reynolds 10A	3	4½	1¼		70	3	1/4	2	70	3	1/4	2		37
Riker B, BB	5	1/4			7¼	4½	1/16	2	20	4	1/16	4	150	38
Rock Falls 1919	3	1/16	1½		43	2	1/16	2	40½	2	1/16	2	87	33
Rock Falls 1920						2	1/16	2					87	33
Rowe CW			1	1/16	19	2	1/16	8	19	2	1/16	8	121½	33
Rowe CDW2	4	1/4	1¼	1/16	45	2	1/16	4	45	2	1/4	4	123	33
Rowe CDW2½	4	1/4	1¼	1/16	51½	2½	1/4	4	51½	2½	1/4	4	147	33
Rowe DEW3½	4	1/4	1¼	1/16	56½	2½	1/4	4	56½	2½	1/4	4	150	36
Rowe FW5	4	1/4	1½	1/16	68	3	1/16	4	68	3	1/16	4	156	38½
Rowe GW3	3	1/16	1¼	1/16									144	33
Sandow G	3	1/16	1	1/16	20	2	1/16	2	20	2	1/16	2	96	34
Sandow CG	3	1/16	1	1/16	20	2	1/16	2	20	2	1/16	2	120	34
Sandow I	3	1/16	1	1/16	60	3	1/16	1	60	3	1/16	1	132	32
Sandow J	3	1/16	1 1/16	1/16	13½	3½	1/4	2	16	3½	1/4	2	144	37
Sandow L	3	1/16	1 1/16	1/16	24	4½	1/4	2	24	4½	1/4	2	144	37
Sandow M	3	1/16	1 1/16	1/16	18½	4	1/4	2	18½	4	1/4	2	144	37
Sanford 25	3	1/4	1¼	1¼	51½	2¼	1/16	1	51½	2½	1/16	1	144	35
Sanford W35	3	1/16	1¼	1¼	56	2½	1/16	1	56	2½	1/16	1	145	35

Replacement Table—Continued

Name, Mode and Tonnage	ENGINE				BRAKE LINING								FRAME	
	Piston Rings		Carburetor		Service				Emergency				Length	Width
	No. per Cyl.	Width	Outlet Diameter	Inlet Diameter	Length	Width	Thickness	No. of Pieces	Length	Width	Thickness	No. of Pieces	Back of Driver's Seat	Over All
Sanford W50	3	1/8	1 1/4	1 1/4	69	3	1/4	1	69	3	1/4	1	145	35
Schacht 2	3	1/4	1 1/4	.....	8 1/2	3 1/2	1/4	2	13 1/2	3	1/4	4	120	35 3/4
Schacht 2 1/2	3	1/4	1 1/4	.....	8 1/2	3 1/2	1/4	2	13 1/2	3	1/4	4	140	35 3/4
Schacht 3 1/2	3	1/4	1 1/4	.....	8 1/2	3 1/2	1/4	4	13 1/2	3	1/4	4	152	35 3/4
Schacht 5	3	1/4	1 1/4	.....	8 1/2	3 1/2	1/4	4	15	4	3/8	4	152	35 3/4
Selden 1 1/2 A	3	1/8	1	1 1/8	11 11/16	3 1/4	1/8	2	11 11/16	3 1/4	....	2	114	34
Selden 2 1/2 A	3	1/8	1	1 1/8	13 5/8	3 1/2	1/8	2	13 5/8	3 1/2	....	2	144	34
Selden 3 1/2 A	3	1/8	1 1/4	1 1/8	15 3/4	3 3/4	1/8	2	15 3/4	3 3/4	1/8	2	195	37 1/2
Selden 5A	3	1/8	1 1/4	1 1/8	18	4	1/8	2	....	4	1/8	2	168	.....
Service 220	3	1/8	1 1/8	1 1/8	12	3 1/4	1/4	2	12	3 1/4	1/4	2	109 1/2	34
Service 31	3	1/4	1 1/8	1 1/8	13 1/2	3 1/2	1/4	2	13 1/2	3 1/2	1/4	2	121 1/8	34
Service 36	3	1/4	1 1/8	1 1/8	13 1/2	3 1/2	1/4	2	13 1/2	3 1/2	1/4	2	121 1/8	34
Service 51	3	1/4	1 1/8	1 1/8	13 1/2	3 1/2	1/4	2	13 1/2	3 1/2	1/4	2	131 1/8	34
Service 71	3	1/4	1 1/8	1 1/8	16	3 3/4	1/4	2	16	3 3/4	1/4	2	150 1/4	38
Service 76	3	1/4	1 1/8	1 1/8	16	3 3/4	1/4	2	16	3 3/4	1/4	2	145 3/4	38
Service 101	3	1/4	1 1/8	1 1/8	18 1/2	4	1/4	2	18 1/2	4	1/4	2	145 3/4	38
Shaw M2	...	....	1	1/8	49	2 1/2	1/4	2	45	2 1/2	1/4	2	60	43
Shaw M4	...	....	1	1/8	11	3	1/4	4	11	3	1/4	4	92	32
Signal F	3	1/8	1 1/8	1 1/8	12	3 1/4	1/4	2	12	3 1/4	1/4	2	211	34
Signal H	3	1/8	1 1/8	1 1/8	12	3 1/4	1/4	2	12	3 1/4	1/4	2	211	34
Signal J	3	1/8	1 1/8	1 1/8	13 1/2	3 1/2	1/4	2	13 1/2	3 1/2	1/4	2	220	34
Signal M	3	1/8	1 1/8	1 1/8	16	3 1/2	1/4	2	16	3 1/2	1/4	2	268	38
Signal R	3	1/4	1 5/8	1 7/8	18	4	1/4	2	18	4	1/4	2	280	38
Stoughton B	...	....	.....	.....	.....	.....	.....	...	.....	.....	.....	...	124	.....
Stoughton D	...	....	.....	.....	.....	.....	.....	...	.....	.....	.....	...	124	.....
Stoughton E	...	....	.....	.....	.....	.....	.....	...	.....	.....	.....	...	136	.....
Standard 56	3	1/8	1	1 1/8	10 11/16	3	1/4	4	10 11/16	3	1/4	4	120	32
Standard 76	3	1/8	1 1/4	1 1/8	13 1/8	3 1/2	1/4	4	13 1/8	3 1/2	1/4	4	122	32
Standard 66S	3	1/8	1 1/8	1 1/8	15 5/8	3 3/4	1/4	4	15 5/8	3 3/4	1/4	4	144	38
Standard 86	3	1/8	1 1/8	1 1/8	17 11/16	4	1/4	4	17 11/16	4	1/4	4	144	38
Sterling 1 1/2	3	1/4	1 1/4	1/4	11 5/8	3 1/4	1/4	8	11 5/8	3 1/4	1/4	8	120	33 1/2
Sterling 2	3	1/4	1 1/4	1/4	13 1/8	3 1/2	1/4	8	13 1/8	3 1/2	1/4	8	120	33 1/2
Sterling 2 1/2	3	1/4	1 1/4	1/4	13 1/8	3 1/2	1/4	8	13 3/8	3 1/2	1/4	8	138	34
Sterling 3 1/2	3	1/4	1 1/4	1/4	15 1/2	3 3/4	1/4	8	15 1/2	3 3/4	1/4	8	144	38
Sterling 5-Worm	3	1/4	1 1/4	1/4	18	4	1/4	8	18	4	1/4	8	158	38
Sterling 5-Chain	3	1/4	1 1/4	1/4	56 1/16	3 1/2	1/4	2	28 3/4	4	1/4	1	158	38
Sterling 7 1/2	3	1/4	1 1/4	1/4	56 1/2	3 1/2	1/4	2	28 3/4	4	1/4	1	158	38
Stewart M7	3	1/8	.....	1 1/8	50 5/8	2	1/8	2	8	5	1/8	2	150 1/2	32
Stewart M8	3	1/8	.....	1	41 3/8	2	1/8	2	22 3/4	2	1/8	1	99 1/2	32
Stewart M9	3	1/8	.....	1	48 1/2	2	1/8	2	8	5	1/8	2	119	32
Stewart M10	3	1/8	.....	1 3/8	60	3	1/8	2	8	5	1/8	2	163 3/4	32
Stewart M11	3	1/8	.....	7/8	41 3/8	2	1/8	2	22 3/4	2	1/8	1	95	32
Sullivan E	3	1/4	1 1/8	1 1/8	13	3 1/2	1/4	8	13	3 1/2	1/4	8	144	33 1/2
Sullivan F	3	1/4	1 1/8	1 1/8	13	3 1/2	1/4	8	13	3 1/2	1/4	8	106	34
Superior D	3	3 3/4	1 1/8	1 1/8	45	2 1/2	1/8	2	44	2 1/4	1/8	2	97 3/4	34
Superior E	3	4 1/8	1 1/8	1 1/8	54	2 1/2	1/8	2	53 1/2	2 1/2	1/8	2	114	34
Texan TK39	3	1/8	1	1 1/4	17 1/2	2 1/4	1/8	4	17 1/2	1 1/2	1/8	4	100	36
Tiffin GW	3	1/8	1 1/4	1 1/4	46	2	1/4	1	46	2	1/4	1	117	35
Tiffin MW	3	1/8	1 1/4	1 1/4	52	2 1/4	1/4	1	52	2 1/4	1/4	1	138	32 3/4
Tiffin PW	3	1/8	1 1/4	1 1/4	58	2 1/2	1/4	1	58	2 1/2	1/4	1	151	35 1/2
Tiffin TW	3	1/8	1 1/4	1 1/4	58	3	1/4	1	58	2 1/2	1/4	1	156	38 1/2
Tiffin UW	3	1/8	1 1/4	1 1/4	58	3	1/4	1	58	2 1/2	1/4	1	156	38 1/2
Titan 3 1/2	3	1/4	1 1/2	1 3/4	60	2 1/4	1/8	2	14	4 1/2	1/8	2	144	34
Titan 5-6	3	1/4	1 1/2	1 3/4	90	2 1/4	1/8	2	14	4 1/2	1/8	2	144	34
Titan 2 1/2	3	1/4	1 1/4	1 1/4	54	2 1/4	1/8	2	26	4	1/8	1	144	32
Tower J	3	1/8	1 1/4	1 1/4	.....	.....	.....	...	.....	.....	.....	...	138	32 1/2
Tower H	...	....	1 1/4	1 1/4	.....	.....	.....	...	.....	.....	.....	...	150	32 1/2
Tower G	3	1/4	1 1/2	1 1/2	.....	.....	.....	...	.....	.....	.....	...	156	37
Traffic C	3	1/8	1	1/8	42 1/2	2 1/2	1/8	2	39 1/2	1 3/4	1/8	2	120 3/4	42
Transport 20	3	1/8	.....	.....	48 1/8	2	1/8	2	45 1/8	1 1/2	1/8	2	101	34
Transport 30	3	1/8	.....	.....	48 1/8	2 1/2	1/8	2	45 1/8	1 1/2	1/8	2	117	34
Transport 50	3	1/8	.....	.....	50 5/8	3	1/8	2	48 1/2	2 1/4	1/8	2	123	34
Triangle AA	3	....	1	1	23 1/8	2 1/2	1/8	1	41	2	1/8	1	94	35
Triangle A	3	....	1	1	10	4	1/8	2	49	2	1/8	1	126	34
Triangle B	3	....	1 1/4	1 1/4	10	4	1/8	2	52	2	1/8	1	132	34
Triangle C	3	....	1	1	10	4	1/8	2	52	2	1/8	1	128 3/8	34
Triumph 1 1/2	...	....	.....	.....	.....	.....	.....	...	.....	.....	.....	...	120	.....

Name, Model and Tonnage	ENGINE				BRAKE LINING								FRAME	
	Piston Rings		Carburetor		Service				Emergency				Length	Width
	No. per cyl.	Width	Outlet Diameter	Inlet Diameter	Length	Width	Thickness	No. of Pieces	Length	Width	Thickness	No. of Pieces	Back of Driver's Seat	Over All
Twin City A & B	3	....	2	2	16	3 1/2	1/4	2	48	3 1/2	1/4	2	138	46
Union F	3	1/4	1 1/4	1	55	3	1/8	1	50	2	1/8	1	144	32
Union H	3	1/4	1 1/4	1	19	3 1/2	1/8	2	10	4	1/8	1	168	34
U.S.N	3	1/8	1	1/8	50 1/2	2	1/8	2	46 1/2	1 1/2	1/8	2	120	34
U.S.R	3	1/8	1 1/4	1/4	46	2 1/4	1/4	2	46	2 1/4	1/4	2	144	34
U.S.S	3	1/8	1 1/2	1/4	50	2 1/2	1/4	2	50	2 1/2	1/4	2	156	36
U.S.T	3	1/4	1 1/2	1/4	62	3	1/4	2	62	3	1/4	2	168	36
Velie 46	3	1/8	1	1/8	54 3/4	2 1/2	1/8	2	52 1/2	2 1/4	1/8	2	120	31
Vim 27	3	1/8	.....	7/8	14 1/2	1 1/2	1/8	4	14 1/2	1 1/2	1/8	4	64	30
Vim 28	3	1/8	.....	1/8	14 1/2	1 1/2	1/8	4	14 1/2	1 1/2	1/8	4	83 1/2	30
Vim 25	4	1/8	1	.....	19	2	1/8	4	19	2	1/8	4	92	32
Vim 22	4	1/8	1	.....	44 1/2	2	1/4	2	44 1/2	2	1/4	2	121 1/4	34
Vim 23	5	1/8	1 1/4	.....	51 1/2	2 1/4	1/4	2	51 1/2	2 1/4	1/4	2	159 1/2	34
Walker M 1/2	...	....	.....	.....	43	2 1/4	1/8	2	18	1 3/4	1/8	4	87	32
Walker K1	...	....	.....	.....	46	2 1/2	1/8	2	18	2	1/8	4	96	32
Walker L2	...	....	.....	.....	53 1/2	2 1/2	1/8	2	22 1/2	2	1/8	4	120	35
Walker P3 1/2	...	....	.....	.....	53 1/2	3	1/8	2	22 1/2	2 1/2	1/8	4	140	35
Walker N5	...	....	.....	.....	53 1/2	3	5/8	2	22 1/2	2 1/2	1/8	4	162	35
Walter S	3	1/4	1 3/4	.....	15	5	1/4	4	57	2 1/2	1/4	2	150	36
Walter T	...	....	1 1/2	.....	14	4	1/4	4	50	2 1/2	1/4	2	144	33
Ward LaFrance 2B-2 1/2	3	1/4	.....	1 1/4	13 1/16	3 1/2	1/4	4	13 1/16	3 1/2	1/4	4	125	33
Ward LaFrance 4A-3 1/2	3	1/4	.....	1 1/2	15 5/8	3 3/4	1/4	4	15 5/8	3 3/4	1/4	4	168	37
Ward LaFrance 5A-5	3	1/4	.....	1 1/2	17 11/16	4	1/4	4	17 11/16	4	1/4	4	168	37
Ward WS	...	....	.....	.....	29	1 1/2	1/8	2	15 3/4	1 1/2	1/8	1	72	37 1/2
Ward WA	...	....	.....	.....	16	1 3/4	1/8	8	16	1 3/4	1/8	8	95	33 1/8
Ward WB	...	....	.....	.....	20	2	1/8	8	20	2	1/8	8	120	33 3/4
Ward WD	...	....	.....	.....	48 7/8	2 1/4	1/4	4	48 7/8	2 1/4	1/4	4	144	33 7/8
Ward WF	...	....	.....	.....	56 7/8	2 1/2	1/4	4	56 7/8	2 1/2	1/4	4	168	34 5/8
Ward WH	...	....	.....	.....	68 3/4	3	1/4	4	68 3/4	3	1/4	4	192	37
Ware 3 1/2 & 1 1/2	...	....	2 1/2	1 1/2	....	3	1/4	...	42	3	1/4	...	120	36
Wells 2	3	1/8	1 1/4	1/4	54	2 1/2	3/8	2	51	2 1/2	3/8	2	120 1/4	34
White 15	3	....	1 1/4	.....	.....	.....	.....	...	.....	.....	.....	...	76 1/2	34
White 20	3	....	1 1/4	.....	.....	.....	.....	...	.....	.....	.....	...	107 1/2	34
White 40	...	....	1 1/4	.....	.....	.....	.....	...	.....	.....	.....	...	157	42
White 45	...	....	1 1/2	.....	.....	.....	.....	...	.....	.....	.....	...	157	42
White Hickory H	3	1/8	1 1/4	1 1/2	13 1/2	3 1/2	1/4	4	13 1/2	3 1/2	1/4	4	116 1/4	32
Wichita R	3	1/4	1	1 3/8	51	2 1/4	1/4	2	51	2 1/4	1/4	2	126 1/2	30
Wichita L	3	1/8	1	1 3/8	45	2	1/8	2	19	2	1/8	2	126 1/2	30
Wichita M	3	1/4	1	1 3/8	45	2	1/4	2	45	2	1/4	2	126 1/2	30
Wichita K	3	1/8	1	1 3/8	19 1/2	2	1/8	4	19 1/2	2	1/8	4	126 1/2	30
Wichita RX	3	....	1 1/4	1 3/4	51	2 1/4	1/4	2	51	2 1/4	1/4	2	126 1/2	30
Wichita O	4	1/4	1 1/4	1 3/4	56	2 1/2	1/4	2	56	2 1/2	1/4	2	152 1/2	36
Wichita S	4	1/4	1 1/2	2	60	3	1/4	2	60	3	1/4	2	163 1/2	36
Wilcox A	3	1/4	.....	.....	24 1/8	2 1/2	1/8	4	16	2 1/2	1/8	4	96	34
Wilcox B	3	1/4	.....	.....	24 1/8	2 1/2	1/8	4	16	2 1/2	1/8	4	132	33
Wilcox C	...	....	.....	.....	27 1/2	2 1/2	1/8	4	20	2 1/2	1/8	4	141	33
Wilcox E	...	....	.....	.....	56 1/2	2 1/2	1/4	2	56 1/2	2 1/2	1/4	2	156	33
Wilcox W	3	1/4	.....	.....	68 1/2	3	1/4	2	68 1/2	3	1/4	2	153	38
Wilson 1 1/2	3	1/8	.....	1	39 1/2	1 3/4	1/8	2	39 1/2	1 3/4	1/8	2	120	33
Wilson 2 1/2	3	1/8	.....	1 1/4	13 1/4	3 1/2	1/8	4	13 1/4	3 1/2	1/8	4	126	33
Wilson 3 1/2	3	1/8	.....	1 1/2	16	3 3/4	1/8	4	16	3 3/4	1/8	4	147	38
Wilson 5	3	1/8	.....	1 1/2	18	4	1/8	4	18	4	1/8	4	147	38 1/4
Winther 39	3	1/4	1 1/4	.....	50	2 1/4	1/4	2	22 1/2	2 1/4	1/4	1	120	30
Winther 430	3	1/4	1 1/4	.....	50	2 1/4	1/4	2	22 1/2	2 1/4	1/4	1	120	30
Winther 49	3	1/4	1 1/4	.....	52	3	1/4	2	50	2 1/4	1/4	2	144	33
Winther 459	3	1/4	1 1/4	.....	52	3	1/4	2	22 1/2	2 1/4	1/4	1	144	30
Winther 70	3	1/4	1 1/4	.....	62	3	1/4	2	60	2 1/2	1/4	2	156	33
Winther 479	3	1/4	1 1/4	.....	62	3	1/4	2	60	2 1/2	1/4	2	156	33
Winther 979	3	1/4	1 1/4	.....	52	3	1/4	2	50	2 1/4	1/4	2	168	33
Winther 89	3	1/4	1 1/4	.....	93	2 1/4	1/4	2	93	2 1/4	1/4	2	156	33
Winther 109	3	1/4	1 1/2	.....	93	2 1/4	1/4	2	93	2 1/4	1/4	2	156	33
Winther 129	3	1/4	1 1/2	.....	93	2 1/4	1/4	2	93	2 1/4	1/4	2	156	33
Winther 149	3	1/4	1 1/2	.....	93	2 1/4	1/4	2	93	2 1/4	1/4	2	156	33
Witt Will N	3	1/8	1 1/4	1 1/4	46	3 1/4	1/4	4	46	3 1/4	1/4	4	102	32
Witt Will P	3	1/8	1 1/4	1 1/4	48	3 1/2	1/4	4	48	3 1/2	1/4	4	122	32
Wolverine C	...	....	1	1	41 1/2	2 1/2	1/8	2	41 1/2	1 3/4	1/8	2	120	34 1/2

News of the Trade in Brief

Twin City's Automotive Show Big Success

The attendance at the Twin City Automobile, Truck, Tractor and Industrial Show, held in the Overland Building, which is located midway between Minneapolis and St. Paul, January 31 to February 7, amounted to an average of about 25,000 a day. Dealers state that the immediate sales resulting from the show were entirely satisfactory. Over ten acres of floor space were covered with the exhibits of the various trucks, tractors, passenger cars and accessories. The first floor and part of the basement were devoted to 248 tractors. Over $300,000 worth of accessories were reported as having been sold during the show.

Dealers report that the farmers in their territory, particularly those in the smaller towns, are turning to trucks, and that they are beginning to realize the great possibilities in them for solving their local transportation problems in the future. They can get deliveries on trucks, and the farmers, as well as the merchants, who figured that they needed a new passenger car this year, but find that they are not sure when deliveries will be made, will take this money and put it in a truck. Over $200,000 worth of trucks were reported to have been sold during the show.

The State Marketing Officials Form Permanent Organization

To co-ordinate the work of the various state marketing agencies, to prevent a duplication of effort, to co-operate on problems of general interest in marketing, and to promote a better understanding between the various interests engaged in marketing foodstuffs were the objects for which the National Association of State Marketing Officials was formed at a meeting held in New York City, February 7, 1920.

Among the many interesting subjects discussed was that of the rural motor express, introduced by the Transportation Committee. The Committee's report suggested "that the various states having organizations devoted to marketing investigate the rural motor express movement in a manner similar to that which the Division of Foods and Markets of New York State Department of Farms and Markets is now doing, and that these states encourage the movement."

In the discussion it was pointed out that the initial expenditure for a motor express line is small, and with proper care has a long period of economic usefulness. Transportation charges, based on operating costs plus a reasonable profit, are more than railroad freight rates, exclusive of hauling charges at points of origin and delivery, and less than railway express. By decreasing the number of handlings the motor express increases the desirability of the product, and, therefore, market value. Ordinarily a shipment is handled five or six times before it reaches the wholesale market, while, with the motor express, the number of handlings is usually two.

Thirty states have officials who may become executive members. Twenty states have been admitted to membership. The organization as formed has a president, Dr. Eugene H. Porter, Commissioner of the Division of Food and Markets of the New York State Department of Farms and Markets; seven vice-presidents, each acting as a chairman of one of the permanent committees; a secretary, L. M. Rhodes, of Florida, and a treasurer, L. G. Foster, of Wisconsin.

The states that have joined the association are Arkansas, Florida, Georgia, Illinois, Maine, Maryland, Massachusetts, Nebraska, New Hampshire, New Jersey, New York, Ohio, Oklahoma, Pennsylvania, South Carolina, South Dakota, Vermont, Virginia, West Virginia and Wisconsin. The director of the U. S. Bureau of Markets is also an executive member.

Coming Events

March 13 to 20, 1920—Asbury Park, N. J. Fifth Annual Show, Passenger Cars, Trucks, Tractors, Accessories. H. W. Schuyler, Mgr., 407 Monroe Ave.

March 22 to 27, 1920—Trenton, N. J. Car and Truck Show. Armory.

March 22 to 27, 1920—Wilkes-Barre, Pa. Commercial Cars. R. A. Rosenkrans, Sec., 35 N. Washington St. (Automobiles, 15th to 22nd.

March (date to be set)—Jersey City, N. J.

March 22 to 27, 1920—Oklahoma City, Okla. Third Annual Farm Power Show. Oklahoma Farm Power Equipment Club. A. E. Kull, Secretary, 3-5 East Reno St. Trucks, Tractors, Accessories and Farm Power Equipment.

March 27 to April 3, 1920—Harrisburg, Pa. Tenth Annual. E. C. Ersminger, Mgr., 1124 Green St. Passenger Cars, Trucks, Trailers, Tractors, Accessories.

March 30 to April 4, 1920—San Francisco, Cal. Pacific Coast Automotive Equipment Exposition. Manager's Office, 815 Gilette Building.

March 31 to April 3, 1920—Goldsboro, N. C. Passenger Cars, Trucks. W. M. Jones, Mgr.

April 4, 1920—Easter Sunday—New Orleans, La. Annual Elk's Fashion Show. (Out doors).

May 6 to 8, 1920—Macon, Ga. First Annual Show, Passenger Cars, Trucks, Trailers, Tractors, Accessories.

Society of Automotive Engineers

New York City, N. Y. Society of Automotive Engineers. Coker F. Clarkson, Sec., 29 W. 39th St. Society and Section Meetings. March 27, Buffalo Section, Buffalo. April 7, Minneapolis Section, Minneapolis. Tractor Weights and Drawbar Pulls.

Foreign Events

Adelaide, Australia, March, 1920—All-Australia Exhibit. Motor Vehicles, Airplanes, Engines and Automotive Equipment.

Buenos Aires, Argentine, April 3 to May 4—Exposition of U. S. Manufactures.

London, England, April or May, 1920—Commercial Vehicle Exhibition. Olympia.

Antwerp, Belgium—May 15 to June 13, 1920. International Exhibition of Motor Cars. June 26 to July 25, 1920—International Exhibition of Commercial and Agricultural Tractors, Camions and Motors. August 1 to September 15, 1920—International Exhibition of Sports, Side Cars, Motorcycles, Cycles, Accessories. Information and application forms may be obtained of James Gustavus Whiteley, Belgian Consul, 223 West Lanvale Street, Baltimore, Md.

Fifty Per Cent Gain in Truck Shipments for 1919

According to figures shown by the monthly report of the Bureau of Foreign and Domestic Commerce, net gains of 50 per cent. in truck shipments over the year 1918 are revealed in the totals for the calendar year 1919. Heaviest gains for American products were registered in the non-car producing regions, such as South America, the Far East and Africa. The least progress was to be noted in Europe and Great Britain, where home manufacturers compete.

The total number of trucks exported and their valuation is here given:

1918	10,308	$26,814,952
1919	15,467	35,099,079

South America increased its demand for motor trucks over 100 per cent., absorbing 796 in comparison with 384 of the year previous.

The truck exports from the United States to Canada jumped to 2164 as against 1596.

England's truck purchases decreased from 2080 in 1918 to 890 in 1919. The sale of army equipment accounts for the slump.

France and Italy are both restricting the American product, so that exports to those countries are falling off; but Belgium, Norway, Sweden and Denmark, whose total purchases from the U. S. in 1918 were 108 trucks, increased to 1807 trucks during the past year.

The Motor Transport Corps Should Retain Individuality

The one proposition involved in the pending bill before Congress for the reorganization of the army which doubtless will most interest the automotive industry of the country is that which has to do with the consolidation of the Motor Transport Corps with what would be known as the consolidated transport corps of the army.

The work done by the Motor Transport Corps throughout the war, and since, under the guidance of Brig. Gen. Charles B. Drake, has been such as to emphasize the importance of having the motor apparatus of the army under a separate corps instead of having it as proposed, simply a unit of a consolidated corps.

The Army Reorganization Bill is still pending, and it is anticipated strong pressure will be brought to bear throughout the country to the end that the Motor Transport Corps retain its present identity and importance.

Motor transport, particularly from the standpoint of the United States army, is in a class by itself, and its proper functioning, it is being pointed out, suggests the need for that specialized form of machinery governing its operations which has proven so successful up to this time.

Goethals Persists That Concrete for Hudson River Tunnel is Best

Major-General George W. Goethals appeared before the New York and New Jersey Tunnel Commissions at the second public hearing on the plan for a vehicular tunnel under the Hudson River and defended his suggestion for a double-decked forty-two foot tunnel of concrete blocks. The meeting was held in the assembly room of the United Engineering Societies' Building in New York on February 23.

General Goethals was not on the list of invited speakers but took advantage of the open discussion to reiterate his faith in the plan he had proposed but which the Commissions shelved in favor of the twin-cast iron tubes recommended by the chief engineer, Clifford M. Holland. General Goethals said that the Hudson River silt is no different from that in other rivers such as the Ohio, Miami and Columbia as well as at the ends of the Panama Canal. He pointed out that he had built concrete structures in all of these and their durability and practical value are unquestioned. He stated that the concrete block tunnel which he advocated can be put through successfully at a far lower price than that proposed for the iron tube project.

John F. O'Rourke, the engineer contractor, who in 1918 offered to build the type of tunnel proposed by General Goethals declared that he could construct it for one half the cost and in one half the time required for the Holland tunnel.

George H. Snyder, of Jacobs & Davies, builders of the McAdoo tubes, pronounced the O'Rourke plan unsafe and stated that the concrete tunnel would collapse.

T. Kennard Thompson and Francis Lee Stewart offered to build a trench tunnel which would be bigger, safer and cheaper than the Holland type and J. C. Meens, of the Cranford Co., said that a steel shell tunnel with concrete block lining could be built in thirty days. Paul G. Brown, member of the United Engineering Societies Committee, which studied the tunnel problem for Governor Smith of New York, stated that not a single engineer familiar with tunnel building in the East and Hudson Rivers favored the Goethal's plan but that on the other hand the report made by Mr. Holland was the ablest he had ever seen on an engineering project.

Turnbull Company Changes Name to Defiance Motor Truck Company

The Turnbull Motor Truck & Wagon Co., of Defiance, Ohio, has recently changed its corporate name to the Defiance Motor Truck Co. For nearly 45 years the Turnbull Wagon Co. was engaged in the manufacture of farm wagons. About two and a half years ago a motor truck department was added to the operations of the plant and the name changed to the Turnbull Motor Truck & Wagon Co. Almost immediately afterwards this plant was requisitioned by the government for the manufacture of artillery escort wagons, but the truck department was still continued with a much reduced production, in order to keep it intact. Since the armistice, truck production has practically forced the wagon business out of the factory.

In the beginning the name "Defiance" was given to the truck, and at the annual meeting of the stockholders and directors it was decided to discontinue the wagon department, devoting the facilities of the entire plant to the manufacture of motor trucks, bodies and cabs. It was also decided to change the name of the company to the Defiance Motor Truck Co.

The following officers and directors were elected for the ensuing year: Chas. H. Kettenring, president; Chas. Behringer, vice-president; R. Carey May, secretary and treasurer; Harry K. Reinoehl, chief engineer; A. M. Pearson, general sales manager. These officers, together with T. T. Shaw, R. P. Kettenring, F. J. Papenhagen, all of Defiance, and Harold S. Reynolds, of Toledo, compose the board of directors.

Northwest to Have Another Tour

The First National Motor Truck Reliability Contest Tour, which will leave Omaha next June and return in about four weeks, covering 2500 miles, under the official sanction of the Contest Board of the American Automobile Association, is meeting with heartiest co-operation and enthusiasm from truck manufacturers. All concerned in the success of the enterprise are giving their best support to the tour. No Sunday driving will be scheduled, which makes four Sunday stopovers, and a total of twenty-four actual traveling days. The route passes through the most fertile agricultural regions of Nebraska, Wyoming, Colorado, Kansas, Missouri, Iowa and South Dakota. Only pneumatic tired trucks not exceeding a carrying capacity of 3½ tons will be permitted to enter. The rules stipulate that all trucks be fully loaded.

The Hydraulic Pressed Steel Company Announces Consolidation

The Hydraulic Pressed Steel Co. announce the consolidation of all their interests under the name of The Hydraulic Steel Co. of Cleveland. The individual plants will be known as follows:

The Hydraulic Pressed Steel Co. of The Hydraulic Steel Co., Cleveland; The Hydraulic Steelcraft Co. of The Hydraulic Steel Co., Cleveland; The Cleveland Welding & Mfg. Co. of The Hydraulic Steel Co., Cleveland; The Canton Sheet Steel Co. of The Hydraulic Steel Co., Canton.

The executive offices of the company are in the Illuminating Building, Cleveland, Ohio, with branch offices in New York, Chicago and Detroit.

National Foreign Trade Conference at San Francisco in May

Members of the commercial car industry are invited to give thought to the opportunity to acquire foreign trade information offered by the Seventh National Foreign Trade Convention, which will be held in San Francisco, May 12 to 15, 1920.

Announcement is made that at the coming convention special trade advisers will be present from the Far East, Australasia and South America to be consulted by American business men. In conjunction with the convention, there will be special foreign trade exhibits held under the auspices of the Los Angeles and Seattle Chambers of Commerce in these two Pacific coast cities.

"The bringing of special trade representatives from the foreign nations to this country so that they may be consulted by American business men is something that should appeal to every manufacturer or merchant and trade organization in the United States," says Secretary O. K. Davis, in commenting upon this feature of the program.

The National Foreign Trade Council, under whose auspices the coming convention will be held, is made up of the leaders of American business engaged in foreign trade. The Council is headed by James A. Farrell, president, United States Steel Corporation. Among the other active members may be named A. C. Bedford, chairman of board, Standard Oil Co. of N J.; Cyrus H. McCormick, president, International Harvester Co., Chicago, Ill.; W. L. Saunders, chairman of board, Ingersoll-Rand Co., New York, and John N. Willys, Willys-Overland Co., Toledo, O.

Extensive plans are under way for the entertainment of delegates and their families and in every way preparations are being made to care for the large attendance which is anticipated. Three special trans-continental trains are announced for the convenience of delegates in the United States. These trains will be made up of special cars from various cities, for reservations in which applications should be made to O. K. Davis, Secretary, National Foreign Trade Council, 1 Hanover Square, New York City.

Snow Disintegrates Highway Beds

Highway authorities state that although the traffic on the highways of America during the winter is small, the money expended in clearing snow from the roadbeds is well spent. Melted snow softens the roadbed and the foundation, or under base, loosens. Considerable damage follows. Ruts are formed. A surprisingly large proportion of road repair work is due to neglect of winter conditions. Snow clearance is certain to become more and more general year by year.

F. R. Ayers, general sales manager of the Standard Four Tire Co., Keokuk, Ia., announces an increased production of more than 100 per cent. as soon as additional space and machinery is ready.

H. C. Bailey has been made advertising manager in place of D. O. Skinner, resigned, for the International Motor Co., makers of Mack trucks. Mr. Bailey comes well equipped, knowing selling, sales managing, advertising and editorial work.

J. A. Barnett, assistant branch manager, has succeeded L. R. Remington as branch manager of the Philadelphia office of Bearings Service Company.

Horace A. Brown, Jr., with the Hyatt Roller Bearing Co. for nineteen years, in which time he has been chief assistant to B. G. Koether, and senior sales engineer, sales manager, etc., has been promoted to the managership of the roller bearings division, with headquarters at Detroit.

Paul Burress has organized the Burress-Heil Hoist and Body Co. in Detroit, and is selling Heil products, compartment truck tanks and Hydro dumping equipment.

Herbert W. Chase has resigned as assistant secretary of the Society of Automotive Engineers, which position he has held for three years. He will associate himself with the Power Plants Corporation, a company organized for the development of engines and other work of related character.

P. C. Chrysler, one of the old guard in automotive circles, has joined the Rainier Motor Corp. as assistant to the sales manager, P. N. Lineberger. Mr. Chrysler has been connected with the motor truck industry from the beginning.

Hamilton Clive has been appointed central territorial sales manager of the Standard Motor Truck Company. His territory includes the central states.

J. H. Compton will be placed in charge of the Minneapolis branch of the White Motor Co., according to an announcement recently made by G. F. Russell, vice-president and general manager of this company.

Personal Items

H. A. Conlon is now district sales manager for the Acason Motor Truck Co., with headquarters at Indianapolis, to cover Indiana and parts of Kentucky, Ohio, Missouri and Illinois.

M. S. Cooper, who has been with the sales department of Willys-Overland, Inc., has become sales manager of the Keystone Motor Truck Corp., Philadelphia, makers of the new Keystone truck. Major Cooper was in the Motor Transport Corps.

I. D. Cross, of the Northwestern Chemical Co., Marietta, Ohio, was recently promoted to Western Sales Supervisor. He will have charge of the entire Western territory.

P. J. Dasey has resigned as sales manager of the Blodgett Engineering and Tool Co. and is with the Midwest Engine Co., Indianapolis, as research and sales engineer.

B. P. Davis has been placed in charge of the Memphis branch of the McGraw Tire & Rubber Company.

H. C. Edwards, with headquarters at Birmingham, Ala., is district sales manager for the Acason Motor Truck Co. for the southeastern states.

Dr. Carlos Fernandez and **A. Antunedesdos,** of the firm of Progredior L. da, Lisbon, Portugal, have been making business arrangements in the United States. In Detroit they secured the privilege of distributing Federal trucks in Portugal and some of its colonies.

E. R. Finkenstaedt, long assistant to Christian Girl (recently resigned) has resigned from the Standard Parts Co., Cleveland.

E. T. Fischer has been made manager of the Denver branch of the McGraw Tire & Rubber Company.

P. J. Foster has severed his connection as district manager of the Federal Motor Truck Co., Detroit, Mich. He will devote his time to the Mohl-Runge-Foster Co., Davenport, Ia., which will act as distributors of Federal motor trucks in that territory.

A. C. Frank, export manager of the Firestone Tire and Rubber Co., has returned from a three months' trip in England and continental Europe. Mr. Frank believes that the overseas business has practically unlimited possibilities for America.

F. C. Fuller has been appointed branch manager of the Detroit branch of the Bearings Service Company.

Dwight T. Hersey, for many years connected with the Splitdorf Electrical Co., has taken over the position of sales director for the Jenkins Vulcan Spring Co., Richmond, Ind.

W. H. Hurley has been appointed district manager of the McGraw Tire & Rubber Company. He will supervise the eastern district and have his headquarters in New York City.

Col. Mark L. Ireland, Motor Transport Corps, has been appointed to the committee on "Economic Theory of Highway Improvement," of which Prof. Agg, Iowa State College, is chairman. The appointment meets with general approval.

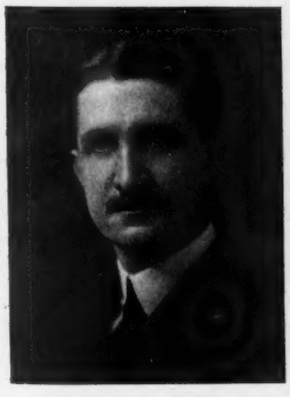
R. A. Kiken, who has been with the Buda Company since early in 1910, and who served two years in the U. S. army, overseas, has been appointed service manager for the prompt disbursement of spare parts.

Edward W. Kruspe, who has been western sales manager of the Standard Motor Truck Co., Detroit, has been placed in charge of the factory sales promotion department.

Myles B. Lambert, many years actively connected with the Westinghouse Electric and Manufacturing Co., is now manager of the Railway Department of that company.

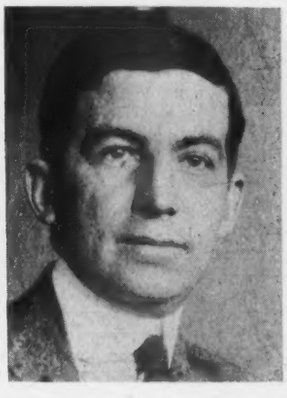
T. L. Lawry has been appointed manager of the steel buildings division of the Liberty Steel Products Company, Inc., manufacturers of structural steel buildings which are issued under the trade name of Libco.

R. P. LeFevre has resigned as district manager for the Nordyke & Marmon Co. in the company's northwestern territory, and is with the California sales force of the Marmon Co.



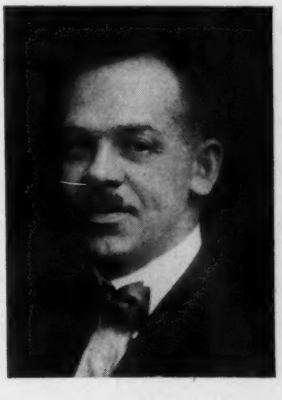
Horace A. Brown

Who has been promoted to Mangership of the Motor Bearings Division of the Hyatt Roller Bearing Co. Mr. Brown will have his headquarters at Detroit.



John A. Callahan

Who was elected to the Board of Directors of the Martin-Parry Corp., Indianapolis, Ind. He will take up the duties of Vice President and director of production.



Chas. E. Stuart

Who has been chosen assistant sales manager of the Selden Truck Corporation, Rochester, N. Y., after serving as salesman, dealer and field sales manager.



F. N. Hammond

Whose appointment as special representative for sales department of the Portage Tire & Rubber Company was recently announced.

F. G. Mauthe has been appointed manager of sales for the Syracuse Rubber Co., Inc., Syracuse, N. Y., makers of the Syra-Cord tire. Mr. Mauthe has a nation-wide acquaintance with the tire trade.

H. P. Mills has been appointed credit manager of the Acason Motor Truck Co.

Guy E. Norwood, president of the Republic Rubber Co., Youngstown, O., has resigned and is succeeded by E. F. Jones, formerly of the Elyria Steel Co., O. Mr. Norwood continues as a director, however.

A. H. Packer is now with the Ambu Engineering Institute, Chicago. His practical experience through a number of important engagements, united with his technical knowledge, well equips him for his new post.

E. F. Paepper, one-time chief engineer of the Republic Motor Truck Co., and later with the American Motor Truck Co., is now chief engineer of the Superior Motor Truck Co., Atlanta, Ga.

L. D. Patterson, for some time factory representative of the Olds Motor Works, has been appointed district sales manager of the Oshkosh Motor Truck Mfg. Co., Oshkosh, Wis. He will supervise the southwestern territory and will have his headquarters at Tulsa, Oklahoma.

Charles G. Percival, Captain Motor Transport Corps, has just returned from France to his old position of advertising manager of the Van Cortland Vehicle Corporation.

Harry Phelps is now purchasing agent for the Atterbury Motor Car Co., Buffalo, N. Y.

F. W. Ramey, of the Cotta Transmission Co., Rockford, Ill., has been placed at the head of the newly organized advertising department which is about to embark on a national advertising campaign.

L. R. Remington, who has been manager of the Philadelphia branch of the Bearings Service Company, has been transferred to the Chicago office of the company, where he will serve in a similar capacity.

W. S. Rugg, manager of Railway and Marine Departments, and **Charles Robbins,** assistant sales manager, of the Westinghouse Electric and Mfg. Co., have been made assistants to the president.

William A. Scharon is now director of automotive publicity of the Link-Belt Co., of Chicago, Indianapolis and Philadelphia. He resigned from the advertising department of the Hyatt Roller Bearing Co.

D. O. Skinner has tendered his resignation as advertising manager of the International Motor Company, New York City, and will devote his time to personal interests.

W. C. Turner has become district sales supervisor of the Four Wheel Drive Auto Co., Clintonville, Wis., and will be located at Omaha, covering Nebraska and Iowa. He leaves the Packard Co., Chicago.

John G. Utz, vice-president of the Standard Parts Co., Cleveland, has resigned.

Julian Victor is now sales manager of the Cord Tire Corp., Chester, W. Va. Factory enlargements under way promise an increased production of over 100 per cent. by July of the Superior Cord tire, which includes a cord tire for the Ford car.

F. L. Waite, for seven years advertising manager with the Reo Motor Car Company, announces his resignation from that company to take effect March 1. Although he will remain in the industry his plans have not yet been made public.

L. J. Ward has left the Bakewell Motor Car Co., Pittsburgh, Pa., and will be sales manager for Carey and Bonner, 32 S. College St., Akron, Ohio, distributors of Service trucks and Mitchell cars.

Frank B. Willys is now sales manager of the Kelly-Springfield Motor Truck Co., Springfield, Ohio. Mr. Willys is a prominent figure in Detroit. He was formerly connected with Chalmers Motor Co. and the former Hal Motor Car Co.

A. S. Winter, until recently advertising and sales manager for the Wm. Powell Company, has joined the sales force of the Fairbanks Company, Pittsburgh, Pa., and will represent them in southern Ohio.

Frank E. Wodell, in Australia for three years for the General Motors Export Co. as trade investigator, is now assistant sales manager in charge of all sales activities at the New York office.

Removals and Trade Changes

Bantam Ball Bearing Co., Bantam, Conn., is preparing to build a reinforced concrete addition to its factory this spring. It has been decided to construct it along the plans of the present plant. In addition to this the company has in view an extensive housing program for the care of the increased working force, incident to this new building.

Acme Storage Battery Co., Poughkeepsie, N. Y., which has recently perfected a reorganization of the company, increasing the capital stock to $175,000, are making arrangements for the enlargement of their plant. The entire factory is also being fitted out with the most modern machinery necessary for the production of batteries.

Tarkington Co., Rockford, Ill., which was recently incorporated with a capital stock of $1,000,000, has signed the contract for the construction of the Tarkington Motor Co. building to be erected in that city. This building, which will be a one-story structure, will cost approximately $90,000. This company proposes to manufacture automobiles and motor trucks.

General Motors Corp., Pontiac, Mich., intend to spend $4,500,000 for the enlargement and improvement of local plants this year. This will require an increase of 2500 more men to fill the vacancies.

Jacquet Motors Corp. has started manufacturing in its Belding, Mich., plant.

Garford Motor Truck Co., Lima, O., is about to build a million-dollar structure in Long Island City, N. Y., to be twelve stories high and have 25,000 sq. ft.

Factory News and Capital Increases

Western Motor Car Co., Farnam, Neb., has moved into its recently completed new $500,000 building. This building includes a beautifully decorated salesroom, well illuminated at night in a conspicuous section of the town. It not only has a completely equipped shop for repair work but also has ample storing facilities. This company handles well-known lines of trucks and passenger cars.

Auto Repair Co., Winston-Salem, N. C., has increased its capital from $25,000 to $100,000 and has also made a slight change in the corporate name, changing it to the Auto Repair & Sales Co. W. H. Masten is president and treasurer; Edgar N. Vaughn, secretary, and Wm. E. Swain, vice-president.

Surety Tire & Tube Co., St. Louis, Mo., incorporated for $1,500,000, will shortly enlarge their plant to enable them to increase their daily production on tires and tubes. E. A. Koerner is president; William L. Burgess, vice-president and general manager; Otto L. Menzing, secretary, and Arthur E. Koerner, treasurer.

The Transport Truck Co., Mt. Pleasant, Mich., has increased its capital to $5,000,000. The directors re-elected were Milton A. Holmes, president; Howard E. Chatterton, vice-president and chairman of board of directors, and A. E. Gorham, secretary-treasurer.

The Amazon Rubber Co., Akron, O., has elected Dr. E. E. Quirk as president, and George Hupp as secretary and general manager. Option on a new factory site in East Akron has been secured, and the capital stock has been increased from $400,000 to $1,500,000.

Baird Tire & Supply Co. is about to change ownership as an option for the sale of this place has been accepted by A. F. Greene, of New London. Mr. Greene intends to carry on the business at its present location.

New Incorporations

The Menominee Motor Truck Co. of Wisconsin was organized February 24, with a capital of $500,000, and will take over the Menominee Truck Co. of Menominee, Mich. Until another locality is selected the factory will remain in Menominee. Offices are in Clintonville, Wis. Antone Kuckuk is president of the new company; Charles Hagen, vice-president; Charles F. Folkman, treasurer; James A. Bell, secretary and general manager.

L. & N. Storage Battery Co., with a capital stock of $50,000, recently filed articles of incorporation for a charter to do business in Logansport, Ind. This corporation proposes to deal generally in electric storage batteries, electrical equipment and accessories.

Harold **Auto Co.**, Hamilton County, Tenn., capitalized at $25,000, recently received a charter to do business in this section. The incorporators are W. M. Coleman, Eugene Wood, Margaret Haney and Lucille Harod.

Anderson Forge and Machine Co. is now styled the Jefferson Forge Products Co., with a stock increase of $300,000, making the total capitalization $1,000,000.

New Agencies

Portage Rubber Company, Barberton, O., has opened a branch at 450 Jackson Street, Milwaukee, Wis. P. S. Manley will be in charge.

Bakersfield Motor Co., Bakersfield, Cal., has the agency for the Samson line of trucks, tractors, etc., in this state.

Black & Decker Mfg. Co., Towson Heights, Baltimore, Md., have established permanent offices and showrooms in Chicago at 1436 S. Michigan Avenue, with R. G. Ames in charge. His territory includes the entire Mid-West.

Owen Tire Co., Boston, Mass., has been made the distributors of McClaren tires for New England.

Exclusive Truck Show in Los Angeles

Motor truck demand has progressed to such volume in Southern California that dealers are to hold a show devoted exclusively to trucks and truck accessories in Los Angeles to open the spring season.

With all main line highways and many laterals in the district surfaced with hard paving capable of carrying loaded trucks, not only general commercial haulage, but operation of highway transportation companies and use of trucks by farmers is due for a tremendous increase this year.

The show will be held under the aspices of the Motor Truck Dealers' Association, for eight days, Saturday, March 27, through Saturday, April 3. It will be held in a huge tent, at Prager Park, Los Angeles, covering a space of 100 x 370 ft. under canvas. The officers of the association are: President, W. F. Ziegler; vice-president, D. F. Poyer; directors, H. G. Pendell, J. P. Scheline, Douglas Boswell. Motor trucks and truck accessories will be exhibited.

Government Now Issues Manual of M. T. C.

National Guard organizations may now obtain, upon request, the Manual of the Motor Transport Corps, A. E. F., authorized by the War Department. Additionally, there is being distributed advance chapters I, II and XVI of a new book, "Regulations for the Operation of the M. T. C."; Highway Traffic Control is the subject specifically treated, and is particularly timely and practically valuable.

Albany, N. Y., Chamber of Commerce strives for legislative appropriation to keep principal highways open the year around. Plans include preservation of show surfaces.

Prediction That the Truck Will Defeat H. C. L.

The confident prediction is made that the complete motorization of the farm will settle the vital and vexing problem of the high cost of living. This cheerful and encouraging announcement was made at a luncheon in New York City recently, attended by representatives of the automobile industry of the United States. H. S. Cunningham, manager of the Goodyear Tire Company in New York City was chairman. Marcus J. Gillen, who has consulted trucking interests said that the response to the idea was so prompt and encouraging that a mass meeting should be held in New York in about a month, at which one thousand representatives of truck, tractor and oil companies, would be present. Motion pictures may be shown at this meeting, showing what the tractor can do on farms. The committee on a mass meeting includes Mr. Cassidy of the Packard Co., and Mr. Bliss of the Garford Company. "The internal combustion engine," said Leon Pettit of the Goodyear Co., "has simplified farming. Eventually it will revolutionize both work and transportation for the farm. There are now $80,000,000,000 invested in farms, more than double the amount invested in manufacturing interests. Railroad investments only total $14,000,000,000. Farmers use 27,000,000,000 horse-power, almost double the amount used in manufactures. Farmers admit the utility of the motor truck and tractor."

Lauraine Magneto Company Chooses New Officers

The Lauraine Magneto Co., Inc., New York State Corporation, of Long Island City, N. Y., held its annual stockholders' meeting on February 7, and the following directors and officers were elected: President, M. Feldine, engineer, New York City; first vice-president, M. G. Leslie, Senator of Pennsylvania, Pittsburgh, Pa.; second vice-president, Leo Potter, New York, N. Y.; secretary-treasurer, A. C. Leslie, Trenton, N. J.; directors, all the above and G. J. Atwell, contractor, Long Island City; E. H. Swindell, manufacturer, Pittsburgh, Pa., and R. W. Turner, contractor, New York City.

Syndicate Organizes Rochester Motors Corporation

ROCHESTER, N. Y., Feb. 25.—A syndicate, headed by Symington, Hoffman & Co., New York and Baltimore, have taken over the good will and assets of the Rochester Motors Co., Inc., and will complete the contracts for the Rochester-Duesenberg 4-cylinder engine. Executive offices will be opened in New York, and a new factory erected at utmost speed.

Wichita Falls Motor Company, Wichita Falls, Tex., has increased its capital stock from $800,000 to $1,800,000. The company manufactures trucks in 1-ton, 1½-ton, 2-ton, 2½-ton, 3½-ton and 6-ton sizes.

Iowa Will Spend $30,000,000 on Roads in 1920

Fred R. White, chief engineer of the Iowa state highway commission announces that the state will build 355 miles of paved road, 231 miles of gravel road, 1,335 miles of earth roads, graded and drained. Besides this 2,000 miles of preliminary work will be done on roads that will eventually receive Federal aid. Paved roads will be of concrete and brick. $30,000,000 will be expended during the present year.

Over 50,000 Farmers Own Motor Trucks

A survey by the United States Department of Agriculture shows that 50,000 farmers use trucks upon their farms. The survey was made by crop reports for the Office of Farm Management, and the Bureau of Crop Estimates, and some truck-equipped farms were doubtless overlooked here and there. The exact number of motor trucks reported is 49,195, and according to states is:

Alabama	847	Nebraska	2,739
Arizona	95	Nevada	41
Arkansas	721	New Hampshire	283
California	1,019	New Jersey	862
Colorado	804	New Mexico	104
Connecticut	357	New York	3,171
Delaware	100	North Carolina	1,450
Florida	380	North Dakota	501
Georgia	1,808	Ohio	2,261
Idaho	329	Oklahoma	723
Illinois	2,261	Oregon	369
Indiana	1,548	Pennsylvania	2,760
Iowa	2,773	Rhode Island	152
Kansas	1,732	South Carolina	1,190
Kentucky	818	South Dakota	1,708
Louisiana	310	Tennessee	978
Maine	435	Texas	1,168
Maryland	596	Utah	173
Massachusetts	661	Vermont	282
Michigan	1,636	Virginia	1,128
Minnesota	1,255	Washington	682
Mississippi	957	West Virginia	465
Missouri	2,065	Wisconsin	1,465
Montana	359	Wyoming	174

Form Cleveland Automotive Service Association

Cleveland, O., Feb. 27.—A movement was launched last evening to form an Automotive Service Association in this city. About 25 service managers, representing truck and passenger car dealers, responded to the invitations sent out by the Automotive Association of the Cleveland Chamber of Commerce.

O. T. Hillshafer, service manager of the Chandler factory, was elected temporary chairman. He appointed a committee of three to call personally on those service managers not present or represented at the meeting. The next meeting will be held March 11.

The meeting last evening is largely due to the efforts of J. L. Huston, president of the local association, and its secretary, Dale Brown. These men have worked industriously to bring the service managers of Cleveland together for the purpose of forming an association which will operate along the same lines as the New York and Newark associations. Cleveland dealers have their service problems as well as those in other cities and it is believed that the new association will go over big at the next meeting. On March 17, Ralph C. Rognon, president of the Automotive Service Association of New York will address the members, and it is expected that other speakers will discuss service problems.

Activities of the Motor Truck Association of Philadelphia

OFFICERS
J. P. CRANSTON, Vice President
W. R. WALTON, Treasurer
W. H. METCALF, Sec'y, 328 N. Broad Street

BOARD OF GOVERNORS
T. K. QUIRK, F. A. KISSEL, E. P. GAUL, W. Y. ANTHONY

THE COMMERCIAL CAR JOURNAL OFFICIAL ORGAN

Plan Tour Through Eastern States

At the February meeting of this association, preliminary steps were taken in connection with running a farm truck tour early this spring in Eastern Pennsylvania, Southern New Jersey, Delaware and Eastern Maryland. In this tour it is proposed to include motor trucks as well as trailers and farm tractors.

In the absence of E. J. Berlet, President, who resigned, J. T. Cranston, Vice President of the association, turned the meeting over to Thomas Quirk, former president, who acted as chairman.

A report was read by the secretary, stating that it is proposed to conduct two or three motor truck tours within a radius of 60 miles of Philadelphia. The tours will be under the direct management of a committee composed of motor truck dealers, tire men and body builders. It is expected that from 15 to 20 makes of trucks will be entered. These will be manned by men furnished by the Philadelphia dealers, representing the factories from which the motor-truck has been secured.

It is also proposed to have three or more makes of trailers accompany the trucks, tors. These tractors to be carried on the trailers or motor-trucks so as not to delay the movement of the tour.

It is the thought of the association to have the tour properly advertised in advance, so that farmers desiring to have work done by tractors, trailers and trucks on their farms, would notify the nearest representative of the tour, and then when the tour comes into that town there will be places assigned for the different units to go to and do the work desired by the farmer or business man.

The association proposes to confer with Mr. Kroh, who conducted the tour for Motor Truck Sales Managers' Association last year; with Charles C. Buckley, manager of the "Ship-by-Truck Bureau," and with G. H. Kiley, who was advance man for the Western farm tour. Both Mr. Buckley and Mr. Kiley addressed the meeting, as did also B. M. Pettit, who gave them some valuable data on the farm truck purchasing power of the farmer.

Mr. Kiley explained how the farm tour would take to the farmer the truck and show him how it could do his work, instead of trying to bring the farmer to the city to see the truck under adverse conditions. The objects of such a tour, he said, were to increase direct sales, to educate country dealers in how to sell trucks and how to secure new country dealers. Another advantage, he said, was that it stimulated highway transportation between outlaying sections, as a substitute for railroad hauling in supplying a hitherto unfilled need.

A special meeting was called of the proprietary members on February 25th, to have these members either sanction or reject the tour plans. The vote was practically unanimous in favor of holding a tour. A special committee will handle the details.

M. A. M. A. to Form Advertising Managers' Council

M. L. Heminway, general manager of the Motor and Accessory Manufacturers' Association has called a meeting of the advertising managers and executives of the company members of the association, to be held in New York City Friday, March 26. The advisability of organizing a permanent advertising managers' council, for constructive co-operative work on advertising problems affecting the automotive industry will be considered. More than 300 companies are members of the association. The proposed council may meet quarterly, monthly, or bi-monthly, exchange ideas, and consider problems of mutual interest. Plans for important constructive work could also be adopted and put into operation.

Oldfield Giant Cord Tire

The Oldfield Giant Cord Tire, which successfully passed all tests several months ago, and which is being manufactured by the Oldfield Tire Co., Cleveland, Ohio, follows closely the characteristics of the Oldfield passenger car tire except in its greater size and in the details of design. The cord themselves are of a multiple type. The tread is the same familiar arrow-head pattern. The tread material is also zinc tempered, a preparation that secures toughness. This method of preparing the tread was developed by President Oldfield.

Fuller to Expand

KALAMAZOO, MICH.—The demand for Fuller transmissions and clutches, manufactured by the Fuller & Sons Manufacturing Company, has made it necessary for the company to expand its present plant. Plans of expansion now under way include the purchase of a ten-acre tract of land adjacent to the plant. A four-story concrete building, 60 x 100 ft., will replace the original brick factory and will give the concern a modern and up-to-date plant with no buildings over five years old.

Officers elected at the annual meeting include Frank D. Fuller, president; L. C. Fuller, vice-president and chief engineer; W. P. Fuller, secretary and sales manager, and W. P. Upjohn, treasurer.

Fuel Prices in Great Britain

The price of gasoline in Great Britain has been raised approximately 20 cents. It now stands at 3s. 8½d., and there is very strong feeling throughout the country against the petroleum interests responsible for the rise. For commercial cars, the price works out to about 3s 1d. for gasoline; 2s. 7d. to 2s. 8d for benzole.

At the annual stockholders' meeting of the **Durston Gear Corp.**, Syracuse, N. Y., R. M. Bean, sales manager, and A. C. Bryan, factory manager, were elected directors and vice-presidents, in recognition of fidelity to the company since 1913.

International Good Roads Tour Changes Route

The 1920 International Good Roads Tour has changed its proposed route to meet road conditions in Michigan. The link from Cheboygan to Grayling, known as "Over the Top," will be abandoned, because of road construction that will be under way in July. The change adds more than 100 miles to the tour, but it is not believed any more time will be consumed than originally allowed. The tour starts from Detroit on the night of July 14, and finishes at Detroit July 29. The tourists camp in Windsor the first night, taking the Detroit ferries at night to avoid traffic congestion, and making the actual travel start on the morning of July 15. The total mileage for the 15 days of good roads boosting will be 1350.

Passenger car and truck owners of America contributed $65,522,259 in license fees toward good roads in 1919, an increase over 1918 of fifteen million dollars. The money is sufficient to build five hundred miles of commercial highway. Highway authorities claim that more than 90 per cent. of license fees are expended upon the roads.

Although scheduled for this issue, we are forced to postpone our Engine Table Specifications until April on account of makers not supplying complete specifications.



EDITORIALS



Who's Going to Pay for the Tours?

MOTOR Truck Tours are being scheduled in great numbers for the balmy spring days which we hope will soon arrive. At a recent meeting of eastern dealers the question of holding a tour was discussed at some length and for a time it appeared as if that particular tour was going to be pigeon-holed. The question arose as to who is going to stand the expense. Many dealers feel that it doesn't pay them to enter a tour on their own expense and that the factory should help defray expenses. As a number of dealers expressed it: "What's the use of us going to a lot of expense and then find at the end of the year that the factory gives the agency to someone else."

We do not agree with these dealers. Any dealer who is "putting them over" in his territory should have no fear of spending a little money on a tour. A tour properly staged cannot help but be of inestimable benefit to the dealer who participates, and in many cases we are sure the factory will cooperate. We would advise the dealers and branch managers to get busy now and find out from headquarters how they feel about this matter so that when they are called upon to enter a tour, they can give a definite decision and not hold up the proceedings. The most important part of a tour is the advance work. The more thoroughly this is done the more beneficial the results.

A Warning Against That Too Independent Feeling

THE steel strike is already having an effect upon the automobile industry. Truck manufacturers as well as others are having difficulty in getting even promises of delivery on steel stock before the last quarter of the year, on all orders which are now being placed. The few months during which the steel fabrication was all but discontinued in this country is but one link in the chain which has been forged around the industry, and which will prevent production reaching anything like the figures it would normally have attained this year.

Briefly, the manufacturers will not be able to produce more than sixty to seventy-five per cent. of the proposed production.

This means that trucks will be in great demand. The production of a number of the factories is practically sold for the year of 1920. The ordinary "stock casher" is giving place to the general manager, vice-president or the president himself, so difficult is it to get deliveries as the parts makers are unable to supply the demand. Among those who have had long experience, this will not mean that they will cease to advertise or that the advertising manager will take a vacation, neither does it mean that the sales department will discontinue its efforts, or that the sales manager will take an unexpected fishing trip. It does mean, however, that production will be less and prices are likely to continue high. Distributors and dealers should carefully analyze the possibilities of their territory and make known their needs to the manufacturers at the earliest possible date.

There is an attitude which has been assumed by some of the parts manufacturers which is not at all business-like. It is that independent, "don't give a damn" feeling which comes when the entire output is spoken for and many are clamoring for more. This feeling almost always leads to trouble, and we cannot too strongly warn the trade that no matter how much they may feel this way, it is always best to treat those with whom they do business just as though they did not know where they were going to sell the next bill of goods.

The makers are optimistic as to the labor situation growing better. The demand for trucks will continue very active as long as there is no possible chance of an over-production, and with an easing up of the material market, all are looking for a very prosperous year.

The Standardization of Wheel Hubs

THE tremendous production schedule recorded by the automotive industry and the headway made by this industry in the past five or six years would have been impossible, had it not been for the use of standard sizes and parts. Without standardization of the many units that go into the make-up of a truck or passenger car, this industry would be forced to limit its output, such as

is the case of the tractor industry of today. In that industry lack of standardization has been directly responsible for the limited output.

Be that as it may, however, there are still some parts on truck and passenger cars which are in need of standardization. Wheel hubs are among those. The fact that hubs are not standardized has meant an immense expenditure of money for wheel companies in fitting up patterns, etc., to fit different axles. This is especially hard on wheel companies entering the disk and steel wheel business. At the present time the Automotive Metal Wheel Association is attempting to co-operate with the Automotive Wood Wheel Manufacturers' Association, the Standard Committee of the S. A. E. and the Tire and Rim Association to accelerate the standardization of wheel hubs.

We sincerely hope that these organizations will give this matter their most earnest attention and that the various committees will speed up their work so that this difficulty will be overcome within a short time. Any action that will help to speed up production and eliminate waste in manufacturing, deserves foremost consideration by all concerned.

Hare's Motors Incorporated

The newly formed organization, Hare's Motors, anticipates an annual business of two hundred millions within five years, according to Emlen S. Hare, formerly a vice-president of the Packard Motor Co. Hare's Motors will jointly control the Locomobile, Mercer and Simplex Companies, and will at the start make three grades of cars, and inside of the five-year period expects to manufacture a complete line, including trucks. Mr. Hare announces that the present models of the Locomobile and Mercer will be continued, and sales for entire output for a long period are assured. Expansion will be limited only by the time factor. Former Packard men now with the new enterprise are H. D. Church, formerly chief engineer truck division; O. E. Hunt, formerly chief engineer motor division; Henry Lansdale, formerly general carriage salesman; F. Van Z. Lane, formerly general transportation engineer.

Molybdenum Steels

The Climax Molybdenum Co. and the American Metal Co., Ltd., with offices at 61 Broadway, New York, has just issued a most interesting seventy-two-page book which gives detailed information on its "Molybdenum Commercial Steels." This product has been well known to metallurgists and alloy steel manufacturers for some time, having been commercially produced and used during the war and since. This new book is a compilation of facts (gathered from independent and unbiased sources) derived from actual experience with this metal. All the data contained in this book has been approved in detail, before publication, by officials and metallurgists of some of the largest consumers and producers of alloy steels in this country. This book is, therefore, more than an exposition of data and illustrations as it contains information of interest and value to anyone having to do with the use or purchase of steel. The text of the book is supplemented by many tables and colored charts and by photomicrographs. The physical properties and the heat treatments of the various types of molybdenum steels are explained in such a way that even the laymen can gather information therefrom which cannot help but be educational.

Keystone Takes Over Commercial Car Unit

The Keystone Motor Truck Corporation has been organized to manufacture automobile trucks, and among other things has taken over the assets of the Commercial Car Unit Company, Philadelphia, Pa.

The Corporation has the following officers: H. B. Harper (of the Overland Harper Company), President; N. S. Cooper (formerly Manager Commercial Car Division Willys-Overland Factories), Vice President in Charge of Sales; C. W. Binns (formerly Secretary and Treasurer of The Commercial Car Unit Co.), Treasurer, and Allan N. Mann, Secretary. The following directors have been elected: J. Kearsley Mitchell, H. B. Harper, M. S. Cooper, P. I. Harper and A. E. Nash.

The Corporation has acquired a property at Oaks, Pennsylvania, having both Pennsylvania and Philadelphia and Reading Railways conections, and is completing its factory buildings, which should be ready for occupancy April 1st. The Executive, Selling and Purchasing Headquarters will be at 42nd and Chestnut Sts., Philadelphia, Pa.

The present production of one and two-ton Keystone models has been sold ahead until May 1st, at which time increased facilities will permit immediate deliveries on both models. The entire capital stock has been subscribed and paid for; there is no stock for sale.

Elyea Company, the oldest equipment house in Atlanta, Ga., has just completed an addition to its building which gives it 10,000 sq. ft. of extra floor space, making possible the installation of a dealers' display room, model machine shop and larger office headquarters as well as better shipping facilities.

J. O. Eaton, president of the Eaton Axle Co. heads the recent combination with the Standard Parts Co., from which Christian Girl recently resigned. Abundant capital is available for both enterprises, and Cleveland bankers have taken $6,000,000 of Standard Parts 7 per cent notes.

Our Next Issue: The successful motor truck dealer of today must know as much about motor truck bodies as he does of the chassis. Many dealers are doing a good business selling stock bodies and it is an advantage to the customer when the dealer supplies the complete vehicle. With this in mind and the fact that our last years' Body Issue created such an unusual amount of interest among the trade, we have decided to feature truck bodies, body parts and fittings in our April issue. This issue will contain valuable information for dealers, including articles on body merchandising; how to measure the chassis for a body; a table of body dimensions, etc. Many special bodies will be illustrated so that the dealer can use this issue as a guide in helping customers make selections.

The Boston Truck Show Expected to Attract Many Dealers

BOSTON, MASS., March 8.—With the opening date of the 18th annual show five days away, March 13 to be exact, indications point to the largest and most successful event ever staged under the auspices of the Boston Automobile Dealers' Association and the Boston Commercial Motor Vehicle Association. Chester I. Campbell, who has built up the Boston shows to a point second to none, is exceedingly optimistic as to the outcome. The demand for space, and interest by dealers, factory branches and manufacturers, appears to bear out Mr. Campbell's statement that it will be the most successful since commercial cars were made a part of the annual Boston event.

Opportunity will be afforded the truck enthusiast to compare the remarkable increase of interest in motor highway transportation for no truck show was held last year as the Government took over the truck sections in the Mechanics Building for storage purposes. And it is interesting to note that during the past three years there has been approximately a greater demand for space than during the previous nine years trucks have formed a part of the exhibits. So great has been the demand for space, both for trucks, trailers, truck equipment and supplies, that room formerly given over to the passenger car and its allied industries will be used for the exhibits of the commercial car industry. Applications for space are still pouring in and effort is being made to provide room for the late comers. There is every reason to believe that the number of trucks, makes and types, and equipment and supply exhibits will greatly exceed those of 1918 which was a very successful show from every standpoint.

Biggest Dealer Event of Year

The Boston truck show is largely a dealer show. It attracts dealers from Maine, New Hampshire and Vermont, to say nothing of Rhode Island and Connecticut. It is visited by dealers from the first three named States who rarely attend the New York events for the reason that it is the policy of the average truck manufacturer to appoint a Boston dealer as distributor for the territory mentioned. This applies to Rhode Island and certain sections of Connecticut not contiguous to New York.

The associate or sub dealers of these Boston distributors find it highly desirable to attend the Boston event. It enables them to study at first hand the new models as well as note the progress in refinements and details in truck designs. It also affords the out-of-town dealer an opportunity to meet the distributor and to thresh out the problems that have arisen during the past year, and there are many if we are to believe the stories of the isolated dealer in particularly northern New England.

Dame Rumor is Busy

The manufacturer will be represented at the show for he is keenly alive to the posibilities of motor highway transportation in New England. There will be the usual conferences between the factory representatives, distributors and dealers and rumor has it that changes are slated, that several makes will be represented by different concerns during 1920. Rumor also has it that some manufacturers are seriously considering reducing the territory allotted, that the results obtained by giving a distributor several States, too large a territory, has not resulted in the sales anticipated nor in the service expected. One local dealer predicts that the New England map of territory will be considerably altered by the time the show comes to an end. These may be rumors, nothing more, but they indicate that closer attention will be given to distribution and representation.

Record Crowds Anticipated

Indications point to the biggest dealer attendance in the history of the shows. The hotels report they have been booked to capacity for some weeks past. Local dealers also report an unusually large number of applications for tickets from their associate or sub dealers, all of which state they are coming if the railroads in Northern New England recover from the effects of the last storm which in many places, entirely eliminated transportation.

At the time of writing nearly 75 makes of trucks, trailers and tractors have secured space at the show. These include the leading makes and one or two new comers. Two departments will be given over to trucks, equipment and supplies and it would not be surprising if part of another would be required to care for the overflow. At the present time the commercial car industry exhibits will be in departments C and D. No less interesting to the dealer will be the display of truck equipment and supplies which include a wide variety of products from special truck spark plugs to bodies. The number of manufacturers who will display exceeds that of 1918 and a number of new devices making for more economical operation of the truck or convenience of the driver will be shown for the first time. Parts and unit manufacturers will be well represented, according to the advance list of exhibitors. Requests for space are still being received.

The show will open Saturday night and continue with the exception of Sunday, until the following Saturday evening. It is held under the joint auspices of the Boston Automobile Dealers' Association and the Boston Commercial Motor Vehicle Association. The officers of the latter are: President, J. S. Hathaway; vice-president, J. W. Maguire; treasurer, E. Day Baker; secretary, Chester I. Campbell. The directors are: P. S. Aultman, E. Day Baker, L. B. Sanderson, J. L. McKone, J. S. Hathaway, N. H. Halliday, J. H. MacAlman, J. W. Maguire and C. P. Rockwell.

Events Scheduled for Week

There will be the usual number of dinners, luncheons, etc., during the week. The Motor Truck Club of Massachusetts will give a banquet on Tuesday evening with covers laid for 300. Among the speakers will be Gov. Coolidge, Alfred D. Way, Jr., executive secretary of the Motor Truck Club of New Jersey; John Cole, the new commissioner of the Public Works Department of Mass., and C. J. Bennett, highway commissioner of Connecticut. Members of the Roads and Bridges Committee, before whom motor vehicle bills are heard, will be among the guests. The dinner committee comprises E. Day Baker, chairman; Norman H. Halliday; John M. Dotter; Dwight W. Sleeper, and James M. Scully.

Tuesday has been officially designated as Motor Truck Club Day at the show and the members of the Truck Club will attend in a body.

The following is a partial list of the trucks to be exhibited:

TRUCKS

Acason
Acme
All American
Atlas
Autocar
Bethlehem
Brockway
Capitol
Chevrolet
Columbia
Clydesdale
Commerce
C-T
Day-Elder
Denby
Dodge
Duplex
Federal
Ford
Garford
G. M. S.
Hall
Huffman
Indiana
International
Jackson
Jumbo
Kelly-Springfield
Kissel
Maccar
Mack
Master
Maxwell
Nash
Netco
Northway
Packard
Paige
Oldsmobile
Oneida
Overland
Phenix
Pierce-Arrow
Reo
Republic
Reynolds
Riker
Sandow
Sanford
Selden
Service
Sterling
Stewart
Sullivan
Traffic
Triangle
Ultimate
United States
Vim
Walter
Walker-Johnson
White
Wilson
Winther

ELECTRICS

Baker
Eastern
Walker
Ward

TRAILERS AND TRACTORS

Fruehauf
Militor
Troy

Taken From Current House Organs

Preparing for Spring Business

We have had so many lessons in preparedness the past few years, and the subject has been so extensively preached, both verbally and in writing, that it may seem almost overdoing the thing to dwell further on the topic. As a matter of fact, however, only too scant heed has been paid to it. And unfortunately some truck dealers—not necessarily of this organization—apparently do not recognize the real importance of always looking ahead. During the winter months, for instance, when the volume of truck sales in a few localities drops off, some dealers evince a desire to cut their schedules to correspond with sales.

The idea is wrong, and if permitted, would operate as a serious handicap to the dealer, for the big spring boom would surely catch him with a depleted stock; and with enormous sales possibilities staring him in the face, he would find himself helpless in the throes of a truck shortage.

And certainly nothing can be more discouraging to a dealer than orders and no stock. Thousands of good dollars slipping through his fingers and he powerless to stop the leak.

The temporary loss is not the only thing to be considered either. Failure to supply public demand gives competitors a footfold, for even though buyers may prefer a certain make of product, they are unwilling to wait indefinitely when the need is pressing.—*Republic Round Table,* Republic Motor Truck Co.

Everybody Advertises

Advertising is one of the greatest forces in the world today. We are all advertising—some by our manner, speech, expression and methods—of what dwells within. The storekeeper displays samples of his stock in his windows. We do the same! And the happy part of it is that we, like the storekeeper, can select in a measure at least, through expression, voice and manner, the kind of characteristics or stock which we will show.—*Rowe,* Rowe Motor Co.

Another Good Roads Argument

Improved roads mean more adequate fire protection for rural districts. This is a good roads argument, if there yet remains any call for additional arguments, which has been rarely mentioned. Very true, the city fire department cannot respond to distant country calls except it be in case of peculiar emergency; but "Good Roads" lead to many more things than simply the fact that markets are made more accessible.—*Messenger,* Standard Parts Co.

The Salesman

He isn't the bird that he used to be
In the days when Bunk was king,
When billions of suckers bestrewed the sea
And flatterers had their fling.
His raucous voice and his rainbow vests
And his goldbrick brand of buzz
Have long since passed to the Place of Pests
In the land of the Used-to-Was.

Time was when that whimsical Latin screed,
That "Caveat Emptor" cry,
Was a mightily fearsome phrase to heed
As you sallied abroad to buy;
For guarantees were as free as the air
And claims were as smooth as oil,
And no one asked if the stakes were fair
Or the game according to Hoyle.

But the salesman-chap of the time called Now
Is a wholesomer breed, my son,
With a first-class brain at the back of his brow,
And a bang-up place in the sun.
He has mastered the science of how folks think,
And why folks "want it," and when,
And he backs his knowledge with printer's ink
And the pep of the adman's pen.

He proves that the flanges of Fortune's wheels
Are grooved to the Golden Rule,
And the tricksome laws of the past repeals,
Since folly fools only the fool.
By his honest heart and his helping hand
And his promise performed and kept
He has climbed to the peak of the Promised Land
While the lovers of knavery slept.

So a simpler air and word that's gold
Are the modern salesman's gift.
Restraint and truth are his stranglehold,
And his deeds they are suave and swift;
For he first makes sure that his line is right,
And his goods are as good as his word,
Then it's **easy** to show what a woeful wight
Was the old-time selling bird!

—Lister R. Atwood, *Accelerator,* Diamond Motor Car Co.

Bankers Take Notice

This year's corn crop is said to amount to 2,900,000,000 bu. or 12,500,000 Government **tons.** If this crop were moved to market an average distance of 5 miles by team and wagon it would cost $108,750,000, as compared with a cost of $54,375,000 if hauled by motor truck, based on averages supplied by U. S. Department of Agriculture.—*Patriot,* Hebb Motors Co.

Overloading is the Foe of Truck Economy

The most short-sighted economy in which the truck owner can engage is that of saving in today's costs of transportation by overloading his truck.

A motor truck is built to carry a rated load. Its component parts are manufactured with that load in view. Reputable builders provide a margin of strength above that required for the truck's capacity, to guard against stress and strain due to unusual road conditions. This is emergency strength only—it is the capital stock of the truck—and is not to be used to pay dividends in operating. To diminish this emergency reserve by constant use is as foolish as to tear down one's house to feed this winter's furnace.

In using trucks for the first time owners may be excused in falling into the errors of overloading. They have been used to horses. Serious overloads in horse hauling are automatically prevented. A willing horse will haul just so much, then flesh and bone rebel. But a motor truck is inarticulate. It does not protest, and for a time may be made to carry considerably more than its rated load.

Seeing the immediate dollars to be made by reducing the contemplated number of loads, owners are sometimes blinded to ultimate cost, and for a time profits pile up. Then, after a year or two, when the truck if properly used should be at its maximum efficiency, it suddenly begins to disintegrate. Strained beyond its resistive power by constant overloading it goes to pieces like the historic "one-hoss shay"—repair bills mount, days out of service cut into profits. The accumulated earnings shrink, then disappear, and one day the unwise truck owner awakens to the fact that he has neither truck nor money.

The facts are so obvious that they should make overloads practically unknown, and yet the abuse continues. Trucks go to pieces, and conscientious manufacturers, who scientifically determine the ability of every separate part of the truck to carry its proportionate share of the contemplated load, are damned for a fault entirely beyond their reach and cure.

What can the truck owner do?

Educate truck loaders and drivers to load within the trucks' capacity. Commend proper loading. Where trucks are used in a single service build bodies to carry capacity loads only. Weigh loads where possible. Train operatives to judge capacity loads by spring deflection, where weighing is impossible. When in doubt as to the weight of a load, play safe.

These precautions will pay in dollars and cents, in long life and more satisfactory service.—*Albatross,* White Co.



Hiram F. Harris

President and General Manager of the Bethlehem Motors Corporation, Allentown, Pennsylvania

MR. HARRIS was born February 23, 1886, at St. Paul, Minnesota. His father was a successful tobacco merchant of St. Paul, Minnesota, where Hiram F. Harris was educated in the public schools, followed by a course of two years at the Mitchell University, South Dakota. After completing his schooling, he entered the journalistic field and became advertising manager of the Sioux Falls Press, at Sioux Falls, South Dakota, later filled the position of business manager until 1912, when he resigned and entered the automotive business, associating himself with the Flanders Motor Company, of Kansas City, as assistant branch manager, remaining with that corporation until November 1, 1913. He then accepted the position of advertising manager of the Maxwell Motor Company, of Detroit, having charge, also, of the sales promotion, and remained there until 1915, when he became assistant general manager of the L. Markle Company (Studebaker branch), of Chicago. The first position he occupied was that of industrial engineer, and there he made a notable record as an organizer and business systematizer. July, 1916, he became connected with the Willys-Overland Company, of Toledo, Ohio, and, owing to his experience and success as an industrial engineer, was selected by that corporation to go to New York and organize the metropolitan district for the Willys interests. He opened the branches in Brooklyn, Newark, Yonkers and the Bronx. He also remodeled the big sales office at Broadway and 50th Street, and under his direction the ten-story service station was erected between 58th and 59th Streets and 10th and 11th Avenues, it being the largest and best-equipped service station for automobiles in the United States. Mr. Harris remained in New York as comptroller of the Willys Company, organizing and equipping all of their Eastern metropolitan plants and operating them under his direct supervision for two years. Early in 1918 he resigned and accepted the position of industrial engineer of the Republic Motor Truck Company, Inc., of Alma, Michigan. While there, Mr. Harris brought up the production to 19,000 trucks per year, this being the largest number of trucks produced by any corporation up to that date. The wonderful success achieved during his stay with the Republic Motor Truck Company won for him an enviable record in the industry. He resigned in July and in August, 1919, he accepted the position of general manager of the Bethlehem Motors Corporation, of Allentown, Pennsylvania, and, on January 21, 1920, was elected president and general manager, as well as a director, in recognition of his services. Mr. Harris is a member of the S. A. E. and the Society of Industrial Engineers, and is a 32d degree Mason.

NEW COMMERCIAL CARS

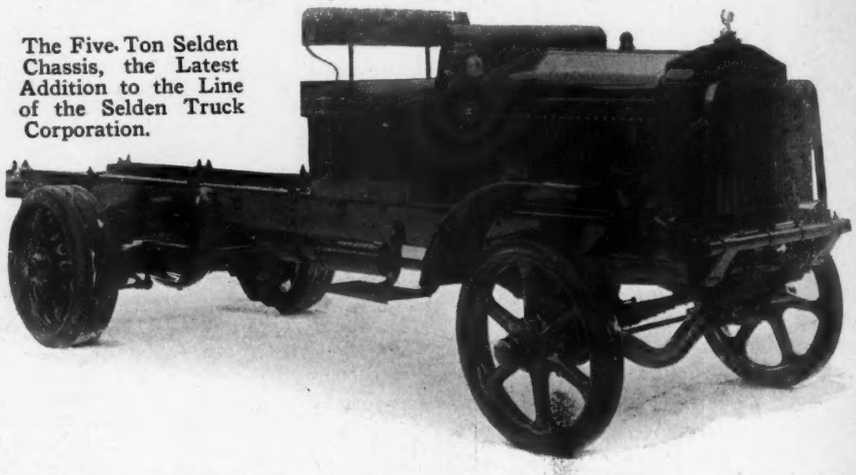
Selden Models to be Continued Without Changes

ANNOUNCEMENT is made by the Selden Motor Truck Corporation, Rochester, N. Y., of the standardization of its "Series A" models, of 1½-, 2½-, 3½- and 5-ton capacity, for at least the next two years. The policy is the culmination of the company's experience in building a line of trucks to meet the variable requirements of motor highway transportation and the decision is based on the results obtained with the Selden product and extends over a period of years in various lines of business. The company is confident that its policy will meet the approval of the dealer and user and that the decision to standardize will simplify service, particularly the parts supply.

The Selden 5-ton chassis, which was shown in public for the first time at the New York Show in January, is a replica of the 2½- and 3½-ton chassis insofar as design is concerned, with the exception that the driver's seat is located at the left instead of the right side as with the other three models. The new chassis embodies the same sound engineering principles as has characterized the Selden product in the past, and throughout attention has been directed towards simplification of the construction and accessibility.

Flexibility a Feature

The efforts of the engineering department have been concentrated on producing a flexible, shock-absorbing chassis and mounting the components so that shocks and vibration are not communicated to them. The frame is an example of the full flexible type, a special construction that absorbs shocks and twisting stresses. It is cross-braced, of ¼-in. stock, 7 in. deep and 3¼ wide. The side members are of pressed, special carbon, manganese steel. The flexible principle is incorporated in the radius rods, these being a pressed steel channel construction. By taking the torque on the springs, instead of on a torque arm, the advantage of having a flexible drive between the axle and truck is retained.

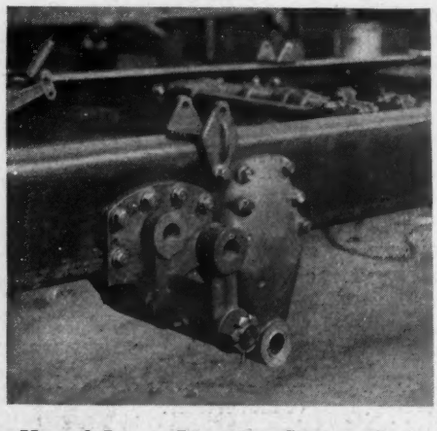


The Five-Ton Selden Chassis, the Latest Addition to the Line of the Selden Truck Corporation.

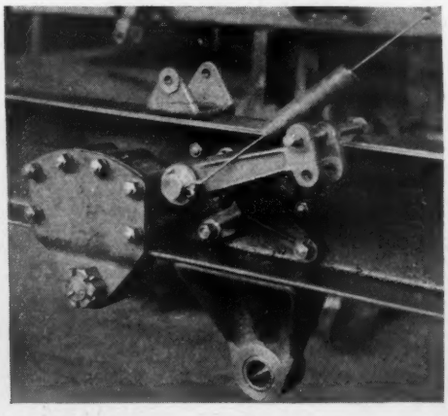
The Selden policy of utilizing bolts instead of rivets for securing all brackets is continued and the absence of rivet and bolt holes in the top and bottom flanges is noticeable. All brackets, cross-frame supports, etc., are retained by high-grade S. A. E. bolts in drilled and reamed holes; in fact, screws, cap screws and bolts are used throughout the chassis. The mounting of the rear spring hangers and radius rod brackets exemplifies this construction, which permits a damaged unit or part to be easily and quickly removed and a new one installed by the average repairman. It is also pointed out that a loose bolt can be tightened; whereas, when a permanent rivet loosens elongation of the hole in the frame and part must must be compensated for by drilling and fitting an oversize rivet. The average truck dealer is not equipped to do this.

Use is made of an extra-heavy and large pressed-steel member bolted to the crankcase and attached universally to the frame for the rear engine supports while the third or front support is around the starting crank housing. The mounting of units to avoid the possibility of weaving or binding is noticeable throughout the chassis. The radiator, for example, is mounted upon a full ball trunnion and braced by a substantial well-anchored stay rod.

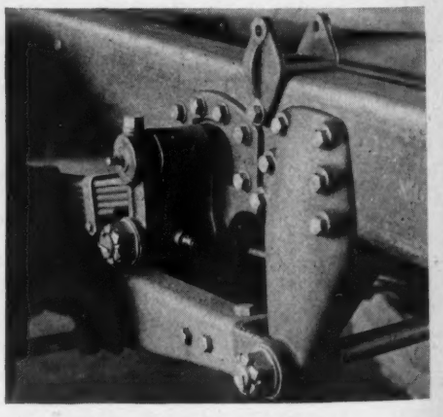
The transmission control is bolted directly to the clutch unit and so located in reference to the driver that the helper may assist by shifting gears under abnormal conditions of operation. The



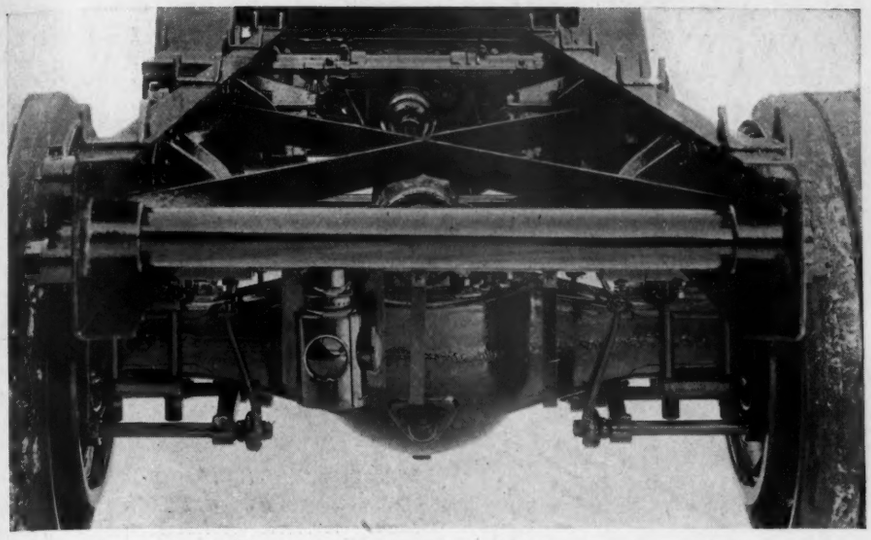
Use of Large Phosphor Bronze Bushings Impregnated With Graphite is Standard Selden Practice



Illustrating How Spring Bracket and Radius Rod Support is Anchored to Inside of Frame Without Drilling Holes in Bottom Flange

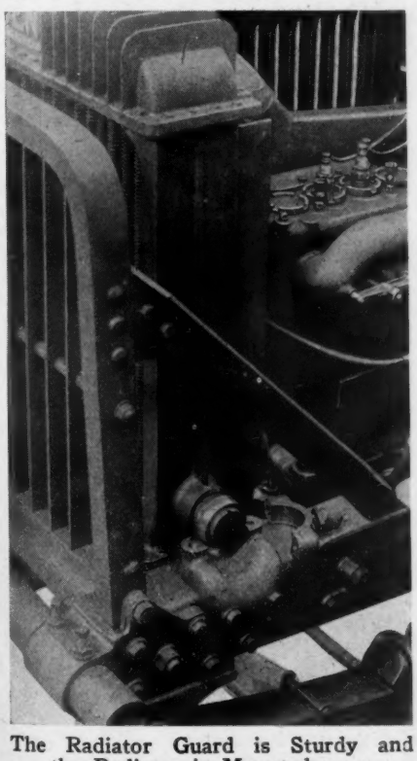


Illustrating the Pressed Steel Flexible Radius Rod, Its Bracket and the Spring Bracket, Also the Body Sill Member



Rear View of Selden 5 Ton Chassis Having a Full Flexible Frame of Sturdy Dimensions

emergency brake lever is attached directly to the frame and convenient to the driver. Binding or springing of the brake rods is avoided by their operating in a straight line, and by the use of over-sized rocker shafts mounted as independent units on the tubular cross-members. Accessible hand adjustment of the brakes



The Radiator Guard is Sturdy and the Radiator is Mounted on a Full Ball Tunnion

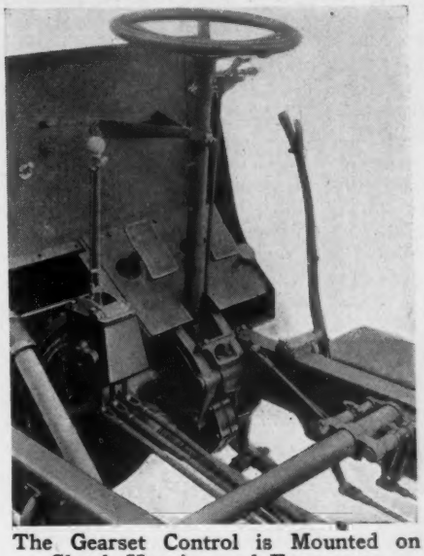
and the use of a differential equalizer in both the service and emergency brakes, are continued in the new chassis.

Lack of attention on the part of the driver to proper lubrication, has led to a more general use of phosphor bronze bushings impregnated with graphite, and to the installation of over-size spring bolts which are hollow and equipped with a connection for the use of a high-pressure grease gun. The use of bushed spring eyes make possible low cost replacement.

The engine of the 5-ton chassis is a four-cylinder, L-head with the cylinders cast in pairs. The bore is 4¾ in., stroke 6, has an S. A. E. rating of 36.1 h.p., but develops 51 b.h.p. at governed speed. The maximum engine speed is 1,100 r.p.m. The crankshaft is supported in three extra large bearings of bronze with an anti-friction lining. The valves have nickel heads, are interchangeable and have a steel locking device, a Selden feature. Lubrication is a combination force feed and splash, the oil being circulated by a double vertical plunger pump.

The cooling water is circulated by a large centrifugal pump on the right hand side of the engine. This pump is of the double-bearing type, having large stuffing boxes. The radiator is a special design with vertical tube core and helical fins. The core is fitted in specially-designed tanks and the sides are well gasketed and bolted. The entire cooling system can be easily and completely drained. The carburetor is a Stromberg with control on dash for enriching of the mixture for starting. The supply of mixture is controlled by a lever under the steering wheel and by an accelerator at right of service brake pedal. The linkage of accelerator is nicely balanced, and the action of the pedal is in a straight line. A block so located that it provides a rest for the foot in a natural position, conserves the energy of the operator when driving over rough roads.

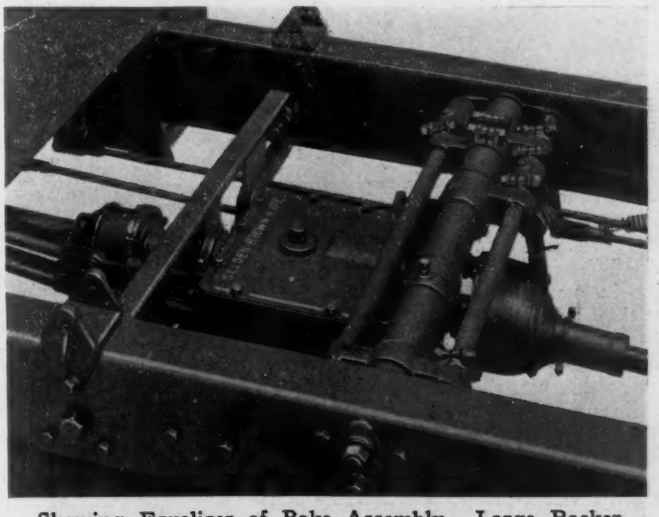
Ignition is by a true high-tension magneto with a push switch on the dash. Control is by a lever in the conventional manner. The clutch is a dry plate, multiple disc, having 19 driving plates. It is over-size, has a self-contained throw-out bearing with large lubricating reservoir. The transmission is located amidships, of the selective type and affords four forward speeds and a reverse. Greater road speed can be maintained than with the conventional chassis as the engine speed is a fixed element and the gear ratio in the rear axle is higher, in order to obtain high speed on level roads. The necessary power for grades and bad roads is obtained by use of special low-gear ratios.



The Gearset Control is Mounted on Clutch Housing and Emergency Brake Lever on Frame

Drive from the clutch to the transmission, thence to the rear axle, is through Spicer universal joints and propeller shafts. The front axle is a Timken, and the rear is also a Timken of the full floating type. The brakes are the new over-size type being provided with the Timken axles. Adjustment of the linkage is by accessible wing nuts on all models with the exception of the 1½-ton chassis.

The springs are Perfection make. The front are 46 in. long, 3½ wide; rear 60 in. long and 4 wide. The rear are banded with bands put on by hydraulic pressure to prevent shifting and shearing of cen-



Showing Equalizer of Bake Assembly. Large Rocker Shafts Are Mounted Independently on Tubular Cross Members

ter bolts. The steering gear is of the semi-reversible, heavy worm and sector type. Adjustment for wear can be made without displacing gear from frame. All connections are liberal in size, and the drag link has hardened and ground steel sockets, held by springs in close contact with ground steel balls. The steering wheel is 20 in. in diameter.

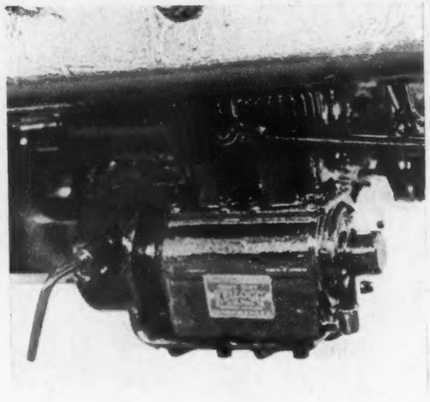
The standard wheelbase is 164 in. which provides space of 153 in. in back of the driver's seat. Special long wheelbase of 192 in. supplied at extra cost. The tread, front, is 68¾ in.; rear, 69½ in. The fuel supply is by gravity from a heavy leaded steel tank of 30 gal. capacity which is mounted under the driver's seat. It has a two-way line, affording a reserve supply, and is also fitted with a capacity gauge.

The hood is of heavy sheet steel, and hinges are all steel. The hinge rods are oversize and fitted with an anti-rattling device. The hood is securely fastened by four large locks. The dash is a steel plate construction and carries the carburetor and ignition controls. The fenders are unusually sturdy and are supported by large cast brackets. Floor boards are of metal, retained by cap screws.

Consideration has ben given to the driver by the use of extra large clutch and brake pedal pads which are pivotally mounted. The rocking motion coupled with the use of the differential brake equalizer make possible the maximum pressure at the brakes with the minimum of effort.

New Wheels to be Used

All Selden chassis will be equipped with all-steel wheels in the future, and



A Power Pump is Mounted and Driven From Gearset When Chassis is Equipped With Big Pneumatics

pneumatic tires will be supplied as special equipment. The new 5-ton chassis comes regularly equipped with 36 x 6 in. single, solid tires in front and 40 x 12 single rear. Option is given of 40 x 6 dual rear. The pressed-on type is standard with demountable optional. Pneumatics, 40 x8, can be obtained as special front tire equipment if desired. A power take-off is provided.

Standard Equipment

The equipment is standardized. A substantial and well-mounted radiator guard, independent of radiator, and a large bumper tube with license plate brackets, are included. The balance of the equipment consists of Boyce Motometer; dash and tail lights; mechanical horn; hubodometer; heavy jack and a complete set of tools. The finish is two coats of lead with colors and lettering extra.

Pneumatics are supplied on the 1½-, 2½- and 3½-ton chassis as special equipment. The sizes are as follows:

	Front	Rear
1½-ton	35 x 5	36 x 6
2½-ton	36 x 6	42 x 9
3½-ton	38 x 7	44 x 10

Provision is made for the installation of electric lighting and starting on all Selden models at an extra price.

The 3½-ton chassis was described and illustrated in the September issue, and the 2½-ton in the December issue of The Commercial Car Journal. The description of the 5-ton will apply to all models insofar as design and policies are concerned.

Specifications Selden 5 Ton Chassis

Capacity	10,000 Lbs.
Chassis Weight	9,800 "
Body Allowance	1,800 "
Wheelbase, Standard	164 In.
Space Back of Seat	153 "
Special Wheelbase	192 "
Space Back of Seat	195 "
Tread, Front	68¾ "
" Rear	69½ "
Road Speed	13 M.P.H.
Engine Four-Cylinder L-Head	
Bore 4¾ In., Stroke 6	
H.P. at Governed Speed	51
Maximum Engine Speed	1,100 R.P.M.
Clutch, Dry Plate, Disc	
Rear Axle, Full Floating Worm	
Transmission Location—Amidship	
Speeds, 4 Forward, 1 Reverse	
Gear Ratios:	
First,	49.6:1
Second,	29.1:1
Third,	15.375:1
Fourth,	10.25:1
Reverse,	59.5:1
Frame—Full Flexible	
Power Take-Off	

St. Louis Includes Motor Bus Service in Its Transit System

THE officials of the Missouri Motor Bus Co. predict nothing but success for the double-deck motor bus service established in the downtown districts of St. Louis. At the present time eight busses are in service, making 40 minute runs, separated by intervals of 10 minutes.

A total of 3,300 passengers rode in the busses of the Missouri Motor Bus Co. on the first day that this line was instituted. J. Lucas Turner, general manager of the company, stated that the total receipts for the day for the 90 trips amounted to $300.

These busses, manufactured by the Barney & Smith Car Company, Dayton, Ohio, differ from those in service in other cities in several details, particularly in that they are built on standard commercial five-ton chasses, manufactured by the Packard and Diamond T Companies, whereas the majority of other large fleets now in use are built on special chassis. It has been the aim of the designers of these busses to eliminate, as far as possible, the use of special materials, employing entirely standard structural steel shapes, etc., which can be secured in any market.

The body is supported and attached to the chassis by steel arms, or brackets, securely riveted to the chassis side members, these brackets being trussed across the top of the chassis and having compression members extending across the chassis, underneath. The side sills are formed of steel angles, on top of which are wood sills. This, with the longitudinal and horizontal wood members, comprise the floor framing. Access to the differential and other parts of the driving mechanism is afforded by trap doors built in the floor immediately above these parts.

The body is of wood, sheathed with steel. The frame is almost entirely of ash, while the floor and roof are of edge grain pine. The roof is covered with canvas, protected by oak strips from wear.

Six windows of the drop type on each side admit ample light. The interior is well aired by ventilators located over each window, and are regulated by shutters on the inside. The outside design of the ventilators is of the horizontal louvre type. These louvres are pressed in the eave panels.

Entrance and exit are on the right side in the rear. The entering platform extends from the rear of the body and is provided with folding steps, operated by the conductor. The stairway to the upper deck rises from this platform. As this stairway is practically two straight ways, it eliminates the inconvenience experienced in climbing the conventional winding stairs. The passengers are protected from possible falls by substantial railings, constructed of iron pipe and wire screening, which border the edges of the stairway and upper deck. The seats are wide and comfortable, those on the inside being upholstered with rattan, while the outside, although of the same style, are without the upholstering. All seats, except the inside front end seat, face forward, with the aisle in the center. The seating capacity is sixty-one persons.

The electrical installation includes push buttons for signalling the conductor, who, in turn, signals the driver by an independent buzzer. Ten 4 cp. lamps to illuminate the interior and two more to furnish light for the rear platform and stairway are provided, in addition to the regular running light. Illuminated destination signs also are provided at the front end. The chasses are equipped with electric starting and generating plants,

which furnish the current for the light and buzzer circuits. The driver's cab is enclosed and is equipped with drop sash, ventilating windshield and independent door, opening outwardly on the right side. The cars are very attractively painted in two colors, maroon and yellow, with the interior finished in cream enamel.

Throughout, the aim has been to secure a bus of substantial construction, without frills, and the result is a vehicle which should give long, economical service, and do much to solve transportation problems in our large cities.

Wolverine Truck-Trailer Incorporates Many Features

BESIDES the many noteworthy features incorporated in the Wolverine truck trailer, manufactured by the Wolverine Truck-Trailer Co., 119-123 Greeley St., Detroit, Mich., it is built carefully and stronger than its rated capacity demands. An exclusive feature of this job is the ball and socket fifth wheel which facilitates speed in coupling and uncoupling. Another prominent feature is the supporting leg, the flexible use of which can be appreciated when the trailer is inactive. The construction of the fifth wheel coupling device enables the operation of coupling the truck to the trailer to be done from truck. All undue strain on the coupling members is eliminated as the ball and socket joint rocks in any direction. The drawbar spring which is connected to the ball and socket member also takes up the stress and strain of starting and stopping. The simplicity and ease of coupling is a valuable asset as it eliminates the necessity of jacking up the trailer or special skill for backing up and under the trailer. The action is practically automatic, coupling from any direction.



Wolverine Trailer Attached to Truck

When uncoupling, the supporting leg which is suspended under the trailer body when not in use is lowered to a standing position, a catch on the coupling is released and the truck pulls away, leaving the trailer supported on its own wheels. The supporting leg is raised and lowered by means of gears operated on the right side of the trailer. The wheels of the supporting leg are small and are pivoted and fitted with sockets in which can be slipped a pair of shafts or a pole for moving the trailer if necessary in loading. This unit can be moved either by manpower or by horse.



Showing Front Support Legs

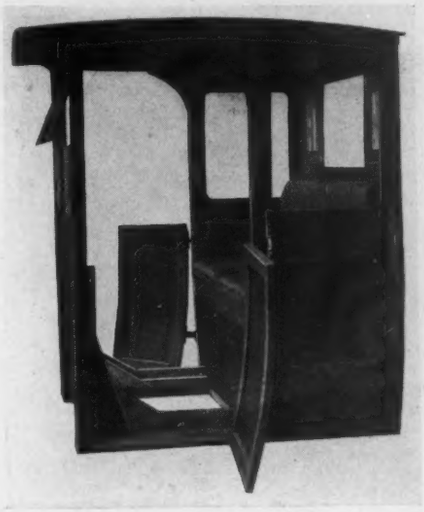
any angle and not merely in a direct line which is necessary in many instances.

The frame which is built along heavy duty lines is of solid steel and of I-beam construction. Any shock taken up by the solid-tire equipped wood wheels is evenly distributed through heavy resilient specially tempered 50-in. springs assembled to the frame by shackles which are equipped with the necessary lubricating devices. The drive is of the Hotchkiss type.

The ball and socket fifth wheel feature of this trailer permits the truck and the trailer to stand on different levels of ground without losing traction on the

All-Metal Truck Cab

A product, which is to be sold direct to truck manufacturers, of the recently organized Brummler-Ruggles Metal Products Co., Iona Ave. and Stevens St., Grand Rapids, Mich., is the Noiseless All-Metal Motor Truck Cab. These jobs are sold complete with upholstering, etc. The parts are electrically welded together and made of heavy material. The cab is made in two pieces so that the seat, dash and windshield can be attached on the chassis, and the cab mounted at any time. Parts are interchangeable. The cab top can be removed readily. The windows slide up into the top and are retained at any position being secured in such a manner as to eliminate rattling.



Brummler-Ruggles All-Metal Cab

Spaulding Commercial Bodies

Several well-built commercial bodies for the Ford chassis are included in the line of the Spaulding Mfg. Co., located at Grinnell, Ia. The feature of this line of bodies is that the sub-frames or sills are made of the best oak or southern ash, seasoned in condensing dry-kilns, equipped with temperature recorders. The flooring of the bodies is made of narrow hardwood boards, 3½-in. wide, tongue and groove construction. These boards are attached to the cross-sills, which construction prevents warping.

Spaulding cabs are built solid or 8-piece collapsible. The latter can be shipped in a 30-in. crate, depending upon the size. The material used is sheet steel, reinforced by hardwood frame. Cabs can be had in the open type or curtain type and the "all weather" cab, a two-door job.



Spaulding Commercial Body for Ford

Ward LaFrance Line Shows Many Refinements in Detail

FOR the year of 1920 the Ward LaFrance Truck Co., Inc., Elmira, N. Y., will produce three chassis; these to be known as models 2B, 4A and 5A, of 2½, 3½ and 5 tons capacity. The model 2B, which supersedes model 2A, is in production. Model 5A, which is a new chassis, will be in production in March while model 4A will be in production in April. The new line of chassis does not contain any departure from the engineering practice which this company incorporated in its original model, but it does contain those refinements in detail which make for longer life, lower maintenance costs and comfort of the driver. Attention has been given to greatly facilitating adjustment of certain components by the mechanic and to reducing the time required for eliminating lost motion due to natural wear.

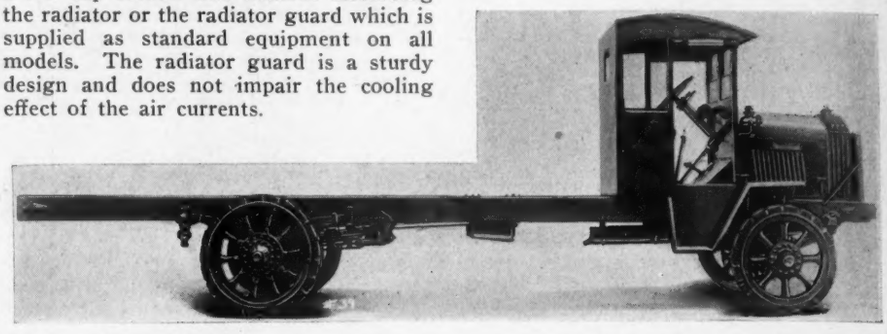
Magazine Lubrication Featured

The magazine or automatic system of oil lubrication of those parts conventionally lubricated by grease—and in which the company was a pioneer—is continued as a feature. Wherever practical, the Bound Brook self-lubricating type of bushing is used; in fact, effort has been directed toward eliminating the human equation insofar as lubrication is concerned. Oversize spring pins and phosphor bronze bushings are noticeable in all models. Bumpers, radiator shutters, Boyce Moto-Meters and thermostatic control are standard equipment. All models have a four-speed transmission with the gearset located amidship.

The engines are larger than those generally used for trucks of the capacities mentioned, the company believing that a greater horse-power production at lower engine speeds will make for greater life as well as afford ample reserve power. It is also claimed that the horsepower developed at governed speed coupled with the use of a four-speed gearset meets every requirement in motor highway transportation. All frames are of the full flexible type, and the absence of holes in top and bottom flanges is noticeable.

Among the more marked refinements in detail is the installation of the radiator shutters. These are constructed as a unit and can be removed as such by displacing a few cap screws and without disturbing the radiator or the radiator guard which is supplied as standard equipment on all models. The radiator guard is a sturdy design and does not impair the cooling effect of the air currents.

Another improvement is the use of a turnbuckle type of brake rod adjuster.



All 5 Ton Chassis Have Towing Hooks, Front and Rear, as Standard Equipment



Showing the Radiator Guard and Shutter Which Can be Displaced as a Unit and Without Disturbing Radiator or Guard. Note the Control of Carburetor for Starting.

Wear of the brake lining and linkage can be compensated for by loosening a nut on either side of the turnbuckle and turning the latter which is equipped with a right and left hand thread. With this design it is not essential to remove cotter pins and clevis pins when adjusting the brake rods and linkage. The Ward La France brake equalizers are retained.

The radius rods also have been improved. The new feature consists of a swivel joint at the frame bracket end which cares for any distortion or movement of the frame. Adjustment is by a nut, and the use of a large fibre washer between the rod proper and bearing member absorbs shocks as well as eliminates the possibility of rattling. Both bearings of the radius rod are lubricated by the magazine or reservoir oiling system in which the lids or caps automatically close.

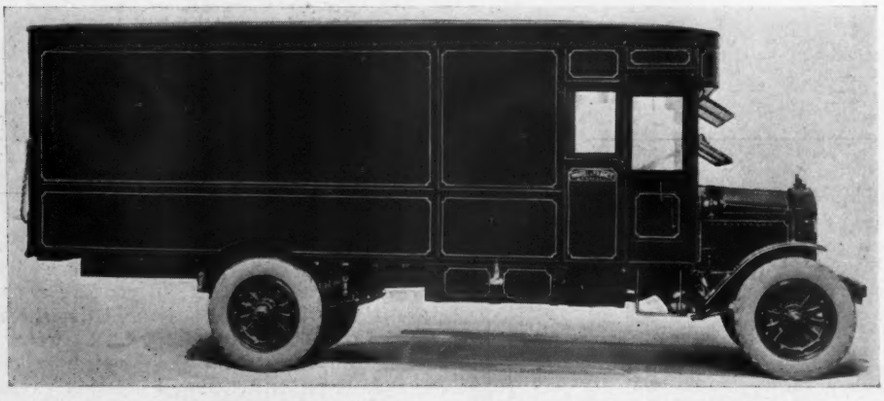
Comfort for the Driver

A refinement in engine design is the use of a wing nut for adjusting the fan belt tension, and another detail is placing the control of the air-choke valve of the carburetor in front, and at the left of the starting crank. Another detail is a spring-tensioned starting crank holder. Attention has been given to the comfort of the driver by using a deep seat which has springs close together to prevent sagging. The sides are upholstered and the back is deep and well upholstered. The windshield is of the four-piece adjustable type and the side curtains are full size.

Another change is the use of steel wheels on the 3 1-3 and 5-ton models. Wood will be continued on the 2½-ton.

The Five-Ton Model

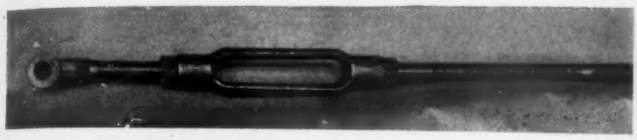
The engine of the 5-ton model is a four-cylinder unit with the cylinders cast in pairs and having a bore of 3 in. and a stroke of 6¼. The S. A. E. rating is 40, but 47 h.p. is claimed at governed speed. The cylinders are cast in pairs, L-head type, enclosed valves, and large hand hole plates afford easy access to the bearings. The engine is suspended at three points, lubricated by a full force feed system, and option is given of a Bosch or Berling magneto. The carburetor is a Zenith. Cooling is by a centrifugal pump,



The Special 2½ Ton High-Speed Chassis Equipped With Giant Pneumatics

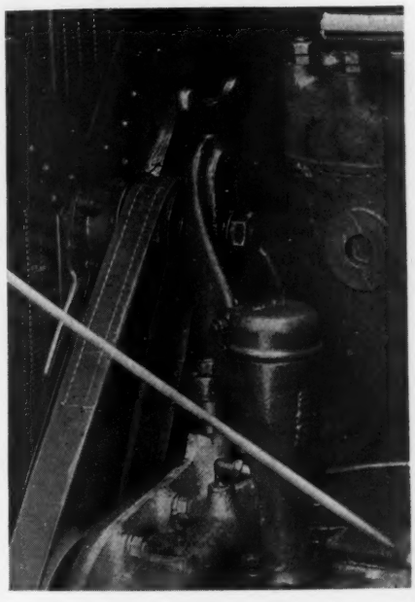
and the radiator is a copper fin tubular type with removable sections. The large opening, non-removable filler cap, a feature of the original Ward LaFrance truck, is still retained. A Motor-Meter is standard equipment as it is on all models. The governor is of the self-contained centrifugal type and is set at 14 m.p.h.

The crankshaft bearings are as follows: Front, 2⅜ x 3¼; centre and rear, 2½ x 4.



Length of Brake Rods Are Altered by a Turnbuckle.

The connecting rod bearings are 2⅜ x 3¼, piston pin bearings, 1⅜ x 2½ piston length 6½; diameter of valves 2⅛ in. The clutch is oversize, an enclosed dry multiple disc of 16 Raybestos discs and 8 steel plates. The four-speed transmission is located amidship on a three-point suspension. The propeller shafts and universal joints are Spicer and a straight line drive is obtained with the truck loaded.



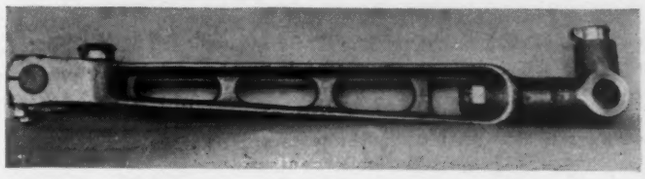
Illustrating the Engine of the Three and a Half Ton and Showing Wing-Nut Adjustment of Fan-Belt Tension

Feature Flexible Frame

The rear axle is a Timken, a worm drive, and the front is also a Timken. The track and clearances are given elsewhere in this article. The rear springs have 16 leaves, are 60 in. long and 4 wide. The front have 12 leaves, are 50 in. long and 3 wide. The front spring pins are 1⅜ in. in diameter, the rear 1½, and the bushings are of phosphor bronze with a 3-16 in. wall. The spring clips are 3½ per cent. nickel-steel, the front being ¾ in. in diameter and rear 1 in. The frame is a pressed-steel construction, 9 in. deep, has 3½ in. flanges and the stock is ¼ in. Steel wheels are used front and rear, and the front are 36 x 6, single; rear, 40 x 6 dual, solids. Option is given of a 163 or 189 in. wheelbase. The steering gear is a Ross and the driver is located at the left. The fuel capacity is 26 gals., the tank being located under the driver's seat. The all-metal cab, flexibly mounted, is still retained although it was stated at the time the writer visited the factory that further improvements might be expected in the design of the cab.

Towing Hooks Standard Equipment

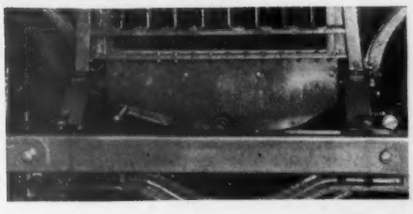
The Ward LaFrance 5-ton truck comes with towing hooks both front and rear as standard equipment, and electric lighting and starting may be had, the equipment being listed as extra. Goodrich solid tires are standard equipment. Control of the radiator shutter is manuak, by a lever under the steering wheel. A feature of the control is that the linkage is rattle and squeak proof, and the rod bearing in the shutter is similarly noise proof. The weight of the chassis, body allowance, loading space, gear ratios, etc., of this and all models, are given in an accompanying table. The equipment includes in addition to that mentioned a hub odometer, oil lamps, horn, tool box, complete set of tools, jack and an oil can.



The Swivel Type of Radius Rod is Magazine Lubricated.

Features of Model 4A Chassis

The same design of engine is employed with the 3½-ton chassis and all engines have detachable heads. The bore and stroke of the Model 4A is 4½ x 6¼, rated at 32.4 by the S. A. E. formula, but the engine is stated to develop 40 h.p. at governed speed. The vehicle speed is 16 m.p.h. with the standard gear ratio. The crankshaft bearings are: Front, 2⅜ x 2¾; center, 2½ x 3½; rear 2½ x 3½. The connecting rod bearings are 2⅜ x 2¾; piston pin bearings, 1⅜ x 2⅛; piston length, 5⅞; diameter of valves 2⅛. The clutch is a 16-plate dry disc, an oversize. The same method of drive, make of universals, axles, etc., are employed as in the 5-ton. The frame is a flexible design, pressed steel, ¼ in. stock, 8 in. deep and 3½ in. flanges. The front springs are 46 x 3, rear 60 x 3½, with clips ¾ and 1 in diam. respectively. Tires are solid, 36 x 5 front, single; and 35 x 5 dual rear. Steel wheels are standard. The equipment is the same as with the 5-ton model with the exception of towing hooks.



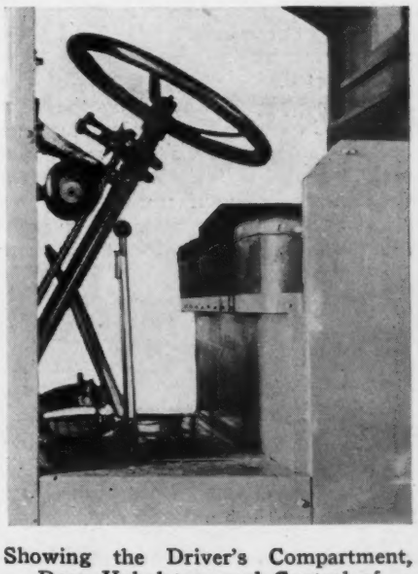
Front View of Three and a Half Ton Chassis, Showing the Spring-Tensioned Starting-Crank Holder

Model 2B, which replaces model 2A, differs only in design in the matter of engine size, type of wheels and method of mounting the radiator. On the 5-ton the radiator is spring suspended while on the 2½ it is mounted on a tubular cross members. The bore and stroke of the engine is 4⅜ x 5¾. The S. A. E. rating is 30.6, but it is stated that the engine develops 37 h.p. at its governed speed. The vehicle speed is 18 m.p.h. with standard gear ratio. The bearing dimensions are as follows: Crankshaft, front, 2⅜ x 2½; center and rear, 2½ x 3¼; connecting rod, 2⅜ x 2½; piston pin, 1¼ x 2½; piston length 5 9-16; valve diameter, 2 in.

The front springs have 10 leaves, 40 in. long and 2½ wide. Rear have 14 leaves, 54 in. long and 3 wide. The spring pins are 1¼ in. diameter, phosphor bronze bushed with bushings walls ⅛ in. The spring clips are ⅝ in. diameter front and ¾ rear. The frame is 7 in. deep, ¼ in. stock and flanges are 2¾. The standard tire equipment is solids, 35 x 4 front, single, and 36 x 7 single or 36 x 4 dual, rear. The equipment is the same as with the 3½-ton chassis.

Special High-Speed Model

In addition the line includes what is termed a special high-speed model of 2½-ton capacity capable of maintaining a speed of from 20 to 25 m.p.h. It comes equipped with 36 x 6 pneumatics front and 42 x 9 rear, demountable rims. This chassis has a four-speed transmission, but the gear ratio of the rear axle is changed to meet the requirements of a high-speed model.



Showing the Driver's Compartment, Deep Upholstery and Control of Radiator Shutter

New Traylor Truck a Highly Standardized Job

IN back of the Traylor truck lies a little bit of manufacturing history that might well be related to show what prompted the Traylor Engineering & Mfg. Co., of Cromwells, Pa., to enter the truck manufacturing field. Incidentally, it may also be mentioned that this company is also producing a farm tractor which was described in the February issue of the CHILTON TRACTOR JOURNAL.

To begin with, the Traylor company had plans laid for building trucks before the war, but when the demand for war equipment came the plans for the trucks were laid aside.

Instead of Traylor trucks there were produced Traylor shells. The Traylor organization not only made good, but made records while making good. It not only produced shells on time, but ahead of time. But that wasn't all. America needed ships. And the Traylor organization —an efficient corps of engineers and manufacturers, but not shipbuilders — took another hitch in its belt and produced them. It enjoys the distinction of being among the last to secure a ship contract and being among the first to produce a ship. And it continued to produce ships at the rate of one a month for the duration of the war.

Now that its war work is over, however, the Traylor Engineering & Manufacturing Co. is proceeding with the manufacture of Traylor trucks and farm tractors.

Under the supervision of W. C. Guilder, general manager, formerly manager of the Mack Works of the International Motor Corp, and of the Kelly-Springfield Motor Truck Co., and W. S. Stevenson, general sales agent, for fifteen years general sales manager of two of the largest truck factories in the country, Traylor trucks are being produced and marketed.

The immense plant used by the company at Cornwells for shipbuilding purposes is now in use as an assembling plant. Coupled with the Allentown plant, now used for manufacturing purposes, this gives the Traylor organization unusual housing facilities. Both of these plants are in operation. The Traylor trucks are to be built in one-ton, one and one-half-ton, two and one-half-ton and three and one-half-ton sizes. Production has already started on the first three sizes.

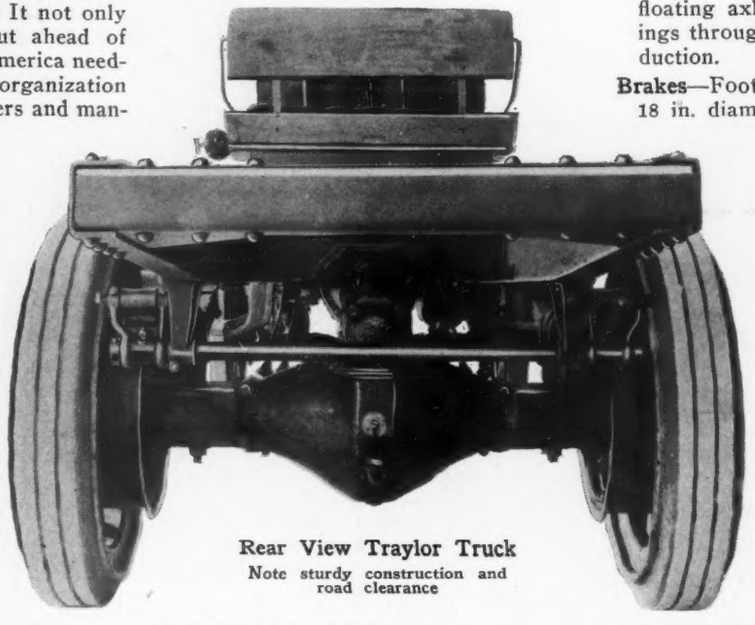
The trucks are built throughout of standard equipment, and are backed by an organization whose name insures continued production and service.

Brief specifications of the Traylor trucks follow:

Two and a Half Ton Specifications

Engine—Buda Model HTU—latest type for heavy duty work.. Bore, 4¼ in.; stroke, 5½ in. Four cylinders, cast in block.

Governor—Pierce governor.



Rear View Traylor Truck
Note sturdy construction and road clearance

Carburetor—Zenith.

Ignition—Splitdorf aero type magneto. Model 448 with enclosed automatic impulse starter.

Cooling—18-in. four blade fan driven by 2-in. flat belt. Water is circulated through straight line connections to the radiator by centrifugal pump.

Radiator—G. & O. make (square fin and tube, removable core). Upper and lower tanks are cast. Extra large filler and cap.

Clutch—Multiple dry disc type.

Control—Left side drive, center control. Spark and throttle control on dash. Specially designed foot accelerator.

Steering Gear—Ross—screw and nut type. 18-in. wheel.

Transmission—Four speed forward and one reverse. Selective type.

Propeller Shaft—2½-in. tubular shaft with three universal joints—center joint carried by self-aligning ball bearing.

Springs—Chrome silico manganese steel throughout. Front, 40 in. long, 2½ in. wide; rear, 52 in. long, 3 in. wide. All eyes bronze bushed.

Frame—Pressed steel channel section, 6½ in. deep, 4 in. width of flange, ¼ in. thick. Reinforced with rigid arched pressed steel cross members.

Axles—Front, drop-forged I-beam section. Rear, worm gear Sheldon semi-floating axle, equipped with ball bearings throughout. 7¾ to 1 standard reduction.

Brakes—Foot brake, internal expanding, 18 in. diam. Emergency brake, 18 in. diam. All brakes inclosed.

Wheels—Schwartz artillery type with interlocking spokes. Front, 12 spokes, 2 in. wide; rear, 14 spokes, 2½ in. wide.

Tires—Solid. Front, 36 x 4 solid; rear, 36 x 7 single or 36 x 4 dual, solid.

Wheelbase — Standard, 150 in.; length of frame back of seat, 142 in. Special wheelbase, 170 in.; length of frame back of seat, 164 in.

Tread — Front, 56 in.; rear, 58 in.

Gas Tank— Heavy welded steel 20-gal capacity; located under driver's seat.

Equipment—Heavy channel steel bumper. Jack and set of tools, tool box, driver's seat, two front side lamps and one rear lamp.

Weight—5550 lb.

One and a Half Ton Specifications

Engine—Buda Model ITU—latest type for heavy duty work. Bore, 4 in.; stroke, 5½ in. Four-cylinder cast in block.

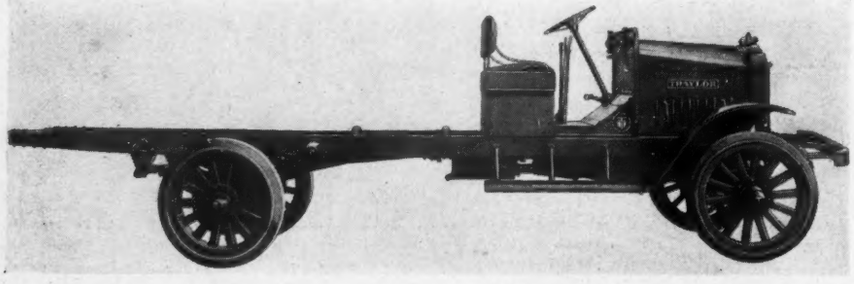
Transmission—Three speeds forward, one reverse. Selective type. Center control left-side drive.

Springs—Chrome silico manganese steel throughout. Front, 38 in. long, 2½ in. wide; rear, 50 in. long, 2½ in. wide. All eyes bronze bushed.

Frame—Pressed steel channel section, 5⅝ in. deep, 3⅝ in. width of flange; 3-16 in. thick; reinforced with rigid arched pressed steel cross members.

Axles—Front drop-forged I-beam section. Rear, worm gear Sheldon semi-floating axle, equipped with ball bearings throughout, 7.7 to 1 standard reduction.

Brakes—Foot brake, internal expanding, 16 in. in diam. Emergency brake, 16 in. in diam. All brakes inclosed.



Two and a Half Ton Traylor Chassis
This company also manufactures models of one, one and a half and three and a half tons capacity

Wheels—Schwarz make, artillery type with interlocking spokes. Front, 12 spokes, 2 in. wide. Rear, 14 spokes, 2¼ in. wide. Size of tires, front, 36 x 4, solid; rear, 36 x 6, solid.
Wheelbase—Standard, 138 in.; length of frame back of seat, 120 in.
Weight—4700 lb.

Governor, carburetor, ignition, cooling, radiator, clutch, control, steering gear, tread, gas tank, equipment, same as 2½-ton specifications.

One-Ton Specifications

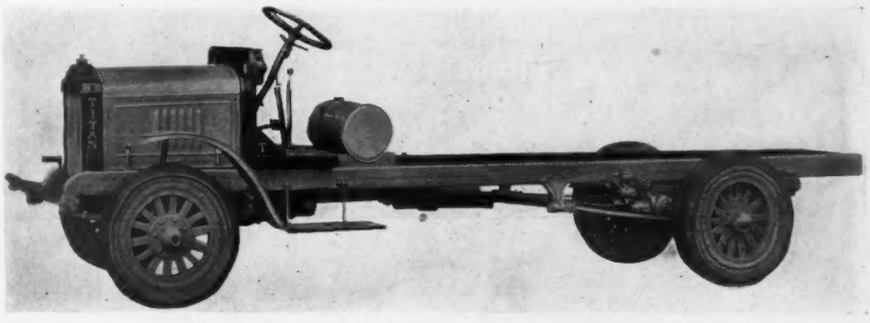
Engine—Buda Model WU—Bore, 3¾ in.; stroke, 5⅛ in. Four-cylinder cast in block.
Cooling—Heavy four blade fan driven by flat belt, thermo-syphon system.
Radiator—G. & O. make. Is of cast tank type, removable core and extra large special designed filler and cap.
Transmission—Three speeds forward, one reverse. Selective type. Center control left-side drive.
Propeller Shaft—Tubular with three universal joints—center joint carried by self-aligning ball bearing.
Springs — Chrome silico manganese throughout. Front, 36 in. long, 2¼ in. wide; rear, 48 in. long, 2½ in. wide. All eyes bronze bushed.
Frame—Pressed steel channel section, 5⅛ in. deep, 3⅜ in. width of flange, 3-16 in. thick; reinforced with rigid arched pressed steel cross members.
Axles—Front, drop-forged I-beam section. Rear, worm gear Sheldon semi-floating axle, equipped with ball bearings throughout, 7.8 to 1 standard reduction.
Brakes—Foot brake, internal expanding, 16 in. in diam. Emergency brake, 16 in. in diam. All brakes inclosed.
Wheels—Schwarz make, artillery type with interlocking spokes. Front, 12 spokes, 1¾ in. wide; rear, 12 spokes, 3 in. wide. Size of tires, front, 34 x 3½, solid; rear, 34 x 5, solid.
Wheelbase—Standard, 132 in.; length of frame back of seat, 117 in.
Gas Tank—Heavy steel tank, located under driver's seat; capacity, 20 gal.
Weight—3500 lb.

Governor, carburetor, ignition, clutch, control, steering gear, tread, equipment, same as 2½-ton specifications.

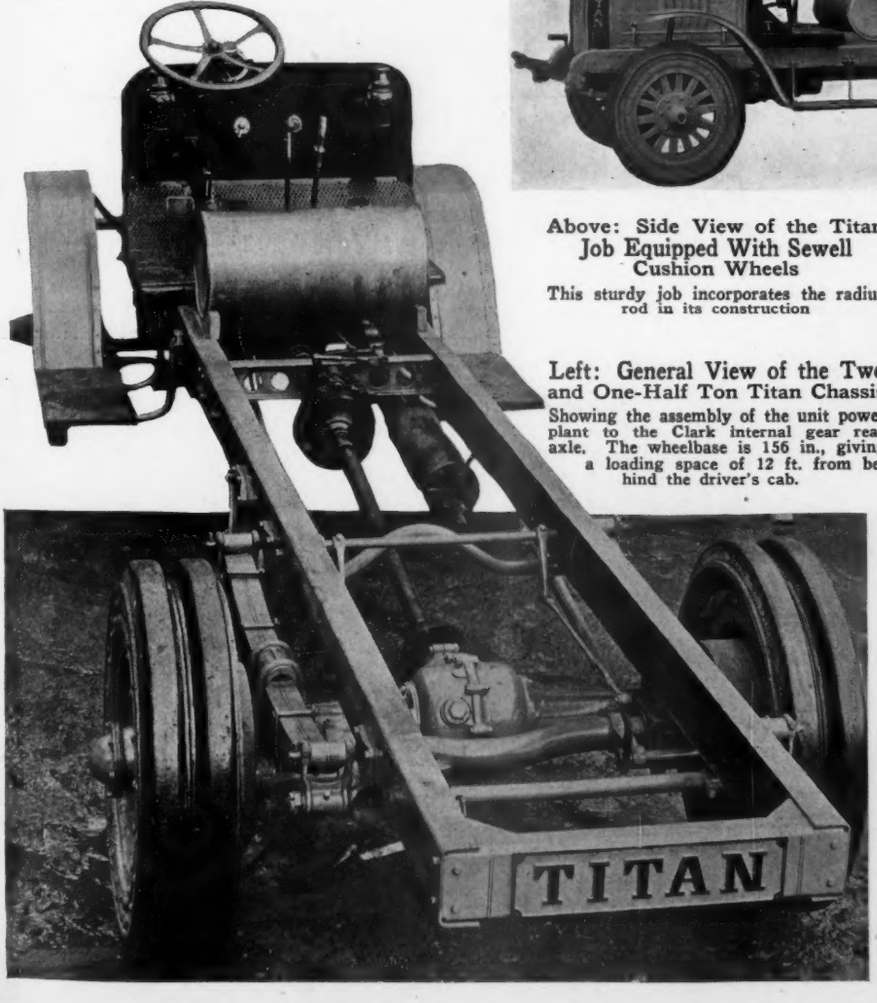
Titan Brings Out New Two and a Half Ton Model

THE new 2½-ton Titan truck, recently announced by the Titan Truck Co., 25th and St. Paul Ave., Milwaukee, Wis., closely follows the principles of construction employed in the older models of the Titan line with but few changes. A unit power plant represents one of these changes and the Wohrab steering gear constitutes another.

The engine is a Buda, model HTU, "L" head type with valves on the right with a bore and stroke of 4¼ and 5½-in., respectively. The cylinders are cast in block and the cylinder heads are detachable. A three-point suspension is used, the rear supporting arms are cast integral with the upper half of the crankcase for support on the frame, and the forward end of the engine being supported at the crank center by a trunnion bracket. The engine is limited to 1100 r.p.m., at which speed it develops approximately 39 h.p., by a simple mechanical governor, driven by a flexible shaft from the camshaft. From the engine, power is transmitted through a Borg & Beck multiple disc, dry plate, 12-in. diam. clutch, in unit with the engine to the Cotta transmission which is also in unit with the engine. It provides four speeds forward, and one reverse. A total gear reduction of 8:1 in low and 42:1 in high is provided. From the propeller shaft equipped with a Northeast Universal Joint the power is transmitted to a Clark Internal gear rear axle.



Above: Side View of the Titan Job Equipped With Sewell Cushion Wheels
This sturdy job incorporates the radius rod in its construction



Left: General View of the Two and One-Half Ton Titan Chassis
Showing the assembly of the unit power plant to the Clark internal gear rear axle. The wheelbase is 156 in., giving a loading space of 12 ft. from behind the driver's cab.

A Stromberg carburetor with a hot air stove is used. Ignition is provided by an Eiseman high tension magneto fitted with impulse starter.

The engine is cooled by water circulated by centrifugal pump. The radiator is of zigzag tube construction, cushioned by spring mounting on the frame. The total water capacity of system is nine gals.

Oil is fed to all bearings by full force pressure feed through drilled crankshaft. It is pumped from the oil reservoir by a gear pump. The pistons and cylinders are lubricated by splash. The timing gears are also fed from the pressure system.

The Wohlrab steering gear is on the left side with manual spark advance and throttle on steering column. The gear shift levers are located immediately above the transmission in the center of the foot-board, to the right of the steering

gear. A foot accelerator is also provided on the floor board. The emergency brake lever is on the right of the steering gear.

The springs are of the semi-elliptic type, 2½-in. wide and 46 in. long in the front; 3 in. wide and 54 in. long in the rear. The spring bolts are fitted with bronze bushings.

The front axle is of heavy drop forged I-beam section, with knuckles of the Elliott type, fitted with large Timken roller bearings.

The frame is of special alloy pressed steel channel section, heat treated, ¼-in. stock and 6-in. high with 3-in. flanges.

The tire equipment consists of 34x4 in. solids in the front and 36x4-in. dual solids in the rear. If pneumatic equipped, the job is equipped with 36 x 6-in. pneumatics in the front and 42 x 9-in. in the rear. Cushion wheel equipment can also be secured.

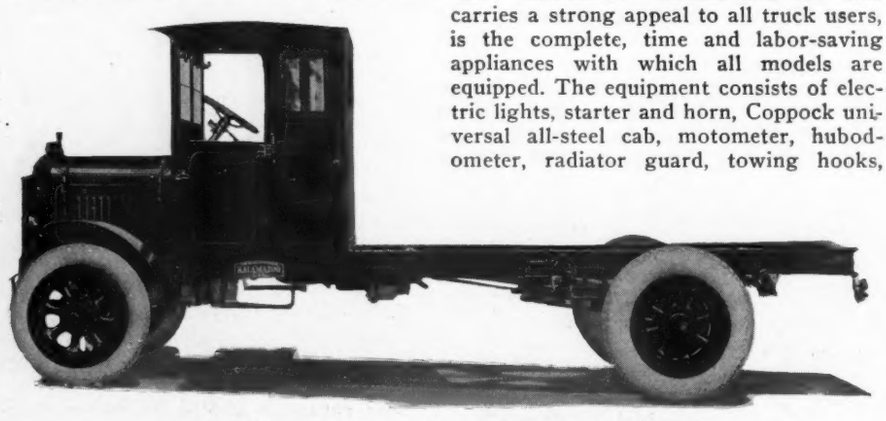
The wheelbase is 156 in., giving a distance of 12 ft. from the back of the seat to the end of the frame, but this truck is also built in a special 128-in. wheelbase for contractors. The tread of both front and rear wheels is 58 in. The turning radius of the 156-in. wheelbase chassis is 24 ft.; of the 128-in. wheelbase, 18 ft.

The standard equipment includes a drivers' cab, complete with cushions and curtains, 6 volt Willard lighting battery, electric spot light, oil side and tail lamps, hubodometer, jack, tool kit and explosion whistle. The price of this chassis complete in gray priming coat is $3400 f.o.b. Milwaukee, Wis.

New Kalamazoo Line Consists of Three Models

THE new 1920 "Kalamazoo" models, consisting of Model G, 1½ tons, Model H, 2½ tons and Model K, 3½ tons, now in production, while of similar design and construction to the 1919 models, embody a number of changes which, viewed from an engineering standpoint, add to this truck's qualifications for efficiency and durability.

The change from the six-cylinder type of engine to the four-cylinder was brought about through a careful study of haulage conditions and requirements, it being finally determined that the 4-cylinder type, through general use and proven efficiency, was the choice of the greater number of truck users. This preference is based principally upon the greater adaptability of four-cylinder engines to general hauling and road conditions and also in the matter of economy. Model G is powered by a 4-cylinder Continental engine and 4-cylinder Wisconsin engines are used in Models H and K. The principal idea of "Kalamazoo" manufacturers being to produce a truck that will follow the designs most popular to truck buyers. A standard idea of design and construction, the adoption of 4-cylinder engines is a matter of adherence.



One of the New Pneumatic-Tired Kalamazoo Jobs
All models are equipped with radius rods

The "Kalamazoo" line throughout is of the heavy-duty type, and to further conform to this type of construction, larger and heavier wheels and tires are now used on all models. Models H and K are now equipped with metal wheels, while Model G wheels are wood but of additional size and weight. In fact, the entire "Kalamazoo" line is of over-size construction throughout, as compared to the majority of other makes of the same rated capacity. All the models are equipped with radius rods, as it is claimed to distribute the torque more uniformly.

One of the essential features of the new "Kalamazoo" models and one that carries a strong appeal to all truck users, is the complete, time and labor-saving appliances with which all models are equipped. The equipment consists of electric lights, starter and horn, Coppock universal all-steel cab, motometer, hubodometer, radiator guard, towing hooks, Alemite lubricator, in addition to tools, tool box, etc. Each chassis is thoroughly and attractively painted.

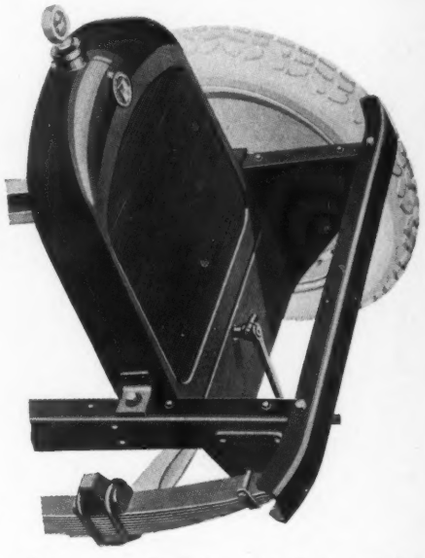
New Truck Built in St. Louis

ST. LOUIS.—St. Louis is to be the home of the new Eagle 2-ton truck, which is to be built by the Eagle Motor Truck Corporation. The truck will sell at $2000.

The officers are T. R. Avars, president; J. P. Reis, first vice-president; H. L. Yawitz, second vice-president; J. W. Hay, secretary, and R. E. Fitch, treasurer.

Graham Brothers Truck Has Removable Bumper

The possibilities of a collision in which the front bumper, while saving the truck itself from injury, may become distorted or bent, is always present, therefore, provision has been made by the manufacturer, the Graham Bros. Co., Evansville, Ind., in view of such a contingency for its removal and repair.



Close-up of Radiator and Frame of the Graham Truck
Illustrating how the removable bumper is assembled

To remove the bumper it is only necessary to extract four bolts, after which the bumper can be straightened at the nearest blacksmith shop. If the bumper were riveted in place, the truck owner would probably neglect having it straightened. This bumper also acts as an additional front cross-member, protecting the frame and power plant against possible distortion, incident to the striking of an obstruction at an angle. The bumper bolts take practically all torsional strains off the front engine cross members.

The embodiment of the pressed steel save about 75 lb. The mud skirt, as may radiator shell in this truck is claimed to be seen from the accompanying illustration, is sturdily constructed and carefully fitted beneath the radiator, another mark of refinement and completeness in this speed truck.

Wisconsin Parts Company Re-elects Officers

OSHKOSH, WIS.—At its annual meeting the Wisconsin Parts Company reelected the following officers and directors for the coming year: W. F. Rockwell, president; J. H. Wall, vice-president; E. J. Dempsey, secretary; Louis Schriber, treasurer, and J. G. Morris.

McGraw Tire and Rubber Co. directors have declared the usual quarterly dividend of seventy-five cents per share on common stock, to stockholders of record of February 20, payable March 1.

KEY OF ABBREVIATIONS

Used in the Specifications of Commercial Cars Listed on the Pages Following

In all Specifications { O—Own / Q—Optional

Engine:
Beav—Beaver
Cont—Continental
GBS—Golden, Belknap & Swartz
Her—Hercules
Hink—Hinkley
H-Sp—Herschell-Spillman
Lyco—Lycoming
Rut-Rutenber
Ster—Sterling
Vict—Victory
Wau—Waukesha
Wis—Wisconsin

Valve Arrangement:
I—Overhead
L—ELL-Head
T—TEE-Head
S—Sleeve

How Cooled:
A—Air
C—Centrifugal Pump
G—Gear Pump
P—Water Pump
T—Thermo-Syphon

Radiator (Make or Type):
Bus—Bush
Can—Candler
EM—English-Mersick
Eur—Eureka
Fed—Fedders
Flex—Flexo
GO—G. & O.
Har—Harrison
Hon—Hooven
Idl—Ideal
Liv—Livingston
Lng—Long
McC—McCord
May—Mayo
Per—Perfex
R-T—Rome-Turney
Spar—Sparton
Spi—Spirex
Stan—Standard
C—Cellular
T—Tubular
H—Honeycomb
V—Vertical

Size of Tires:
*—Pneumatic
†—Dual

Lubrication:
B—Force and Splash
C—Centrifugal Pump
F—Force Feed
G—Force and Gravity
P—Pump

Carburetor:
B&B—Ball & Ball
Bent—Bennett
Cart—Carter
Ens—Ensign
Flch—Flechter
Holl—Holley
John—Johnson
Mar—Marvel
Mas—Master
Mill—Miller
Strm—Stromberg
Shk—Shakespeare
Sheb—Schebler
Till—Tillotson
Zen—Zenith

Fuel Feed:
G—Gravity
P—Pressure
V—Vacuum

Ignition System:
Aer—Aero
AtK—Atwater-Kent
AuL—Auto-Lite
Bat—Battery
Bos—Bosch
Ber—Berling
Con—Connecticut
Del—Delco
Eis—Eisemann
Kin—Kingston
Mag—Magneto
NE—North East
POL—Prest-O-Lite
Sim—Simms
Spl—Splitdorf

Engine Starter:
L—Auto-Lite
B—Bijur
D—Dyneto
G—Gray & Davis
E—Leece-Neville
N—North East
R—Wagner

Clutch:
B—Borg & Beck
C—Cone
D—Disc
F—Fuller
G—Detroit Gear & Mach.
H—Hartford
L—Brown-Lipe
M—Merchant & Evans (Hele-Shaw)
U—Muncie
W—Warner

Transmission:
B-Li—Brown-Lipe
Cott—Cotta
Covt—Covert
D-Sea—Driggs-Seabury
Det—Detroit
Durst—Durston
Full—Fuller
G-Lee—Grant Lees
MM—Mechanics Mach. Co.
Munc—Muncie
Plan—Planetary
Rock—Rockford
Selec—Selective
Warn—Warner

Location of Transmission:
A—Amidships
R—Rear
U—Unit with motor
UJ—Unit with Jackshaft

Final Drive:
B—Bevel Gear
C—Chain
E—External Spur Gear
F—Friction
I—Internal Gear
N—Concentric Spur
P—Spur
R—Double Reduction
S—Spiral Bevel
W—Worm

Universal:
Acm—Acme
Arv—Arvac
Bld—Blood Brothers
Flex—Flexite
Hart—Hartford
K-B—Kinsler-Bennett
Mech—Mechanics
M & E—Merchant & Evans
Pet—Peters
Spic—Spicer
Ster—Sterling
Ther—Thermoid
UM—Universal Machine
UP—Universal Products

Rear Axle:
Badg—Badger
Cel—Celfor
Chi—Chicago
Cl—Clark
Emp—Empire
Hind—Hindley
Own D—Dead, Own design
W—Westinghouse
Rock—Rockford
Russ—Russel
Sals—Salisbury
Shel—Sheldon
Stan—Stan-Par
Tim—Timken
Torb—Torbensen
W-M—Weston-Mott
Wis—Wisconsin
Flot—Floating
½-Fl—Semi-Floating
¾-Fl—¾ Floating

Springs:
Cham—Champion
Det—Detroit
GC—Garden City
Hig—Higgins
Kal—Kalamazoo
Lah—Laher
Mar—Maremont
Math—Mather
Mer—Merrill
Nat—National
Row—Rowland
Per—Perfection
Shel—Sheldon
SP—Spring Perch
Stan—Stan-Par
Ster—Sterling
Tem—Temme
Tut—Tuthill
US—United States
Cant—Cantilever
Elip—Full Elliptic
S-El—Semi-Elliptic
¾-El—¾-Elliptic
S&C—Semi and Cantilever
S&¾—Semi and ¾-Elliptic

Steering Gear:
CAS—C. A. S. Products Co.
Dit—Ditwiler
Gem—Gemmer
Jac—Jacox
Lav—Lavine
Ross—Ross
W—Worm
Warn—Warner
Wohl—Wohlrab

Governor:
C—Centrifugal
Cont—Continental
Del—Delaney
Dup—Duplex
Hink—Hinkley
Mer—Merrill
McC—McCanna
Mon—Monarch
Pier—Pierce
Rug—Ruggles
Simp—Simplex
Wau—Waukesha

Wheels:
Arc—Archibald
AuW—Auto Wheel
Bim—Bimel
Cla—Clark
Day—Dayton
Det—Detroit
E&O—Eberly & Oris
Hay—Hayes
Hoo—Hoopes Brothers
Jon—Jones
Kel—Kelsey
Mil—Military
Mut—Mutual
Pru—Prudden
Roy—Royer
Rus—Russell
Sal—Salisbury
Sch—Schwartz
Smi—Smith
Sta—Stanwell
StM—St. Mary
Stn—Standard
Wan—Wayne
W&L—Waterhouse & Lester

Rim Equipment:
Bak—Baker
Det—Detroit
Fir—Firestone
Gdy—Goodyear
Jax—Jaxon
Kel—Kelsey
Stn—Stanweld

Commercial Car Specifications—Corrected Monthly

The Specifications, Chassis Prices, Etc., Are Corrected Each Month From Data Supplied Direct by the Makers. Gasoline Tractor-Trucks and Electric Commercial Cars Will be Found at the End of Gasoline Commercial Cars

See Also Replacement Table in "Service and Repair Departments." Truck Frame Dimensions Are Included in Replacement Table

(All New Models and Changes in Current Models Are in Heavy Type)

(Where prices are not given they may be had on application to the manufacturer)

Model	Chassis Weight	Chassis Price	Engine—4 Cyl. unless otherwise noted	Bore and Stroke	Horsepower	Valve Arrange't	How Cooled	Radiator Make or Type	Lubrication	Carburetor	Fuel Feed	Ignition System	Engine Starter	Clutch	Transmission	Speeds Forward	Location of Transmission	Universal	Final Drive	Rear Axle	Total Gear Reduction in High	Total Gear Reduction in Low	Springs	Front Tires	Rear Tires	Steering Gear	Wheelbase	Governor	Wheels—Make	Rim Equipment	Pr. Cent of Weight on Rear Wheels
800 Pounds																		**800 Pounds**													
Overland	1777	900	Own	3⅛x5	18.2	L	T	C	B	Till	...	Con	L	C	Selec	3	....	Own	B	¾-Fl	.....	.....	S&C	31x4*	31x4*	Own	104	.....	.....	.....	63.8
Pony	800	320	Own	2¾x4	12.1	L	T	H	B	Strm	G	AtK	...	...	Fric	3	....	Dead	C	O	4.25:1	12.25:1	Tut	28x3	28x3	Own	92	.....	Pru	.....	60
1000 Pounds																		**1000 Pounds**													
Dodge	1975	1010	Own	3⅞x4½	24.1	L	C	T	B	Stew	V	Own	N	D	Selec	3	U	Own	S	Flot	4.16:1	19.41:3	.....	33x4	33x4	Own	114	.....	.....	Own	41
Ellsworth 25A	2100	....	Lyco	3¼x5	16.9	L	T	T	S	Cart	G	Con	A	C	GLee	3	U	Stan	B	Gem	4.75:1	16:1	Shel	30x3½*	30x3½*	Fos	108	.....	Sal	Det	70
Vim 27	2120	1095	Own	3 x4½	14.4	L	T	MoC	B	Zen	G	AtK	...	C	Selec	3	U	Spic	W	Shel	5.5:1	.....	Shel	31x4*	31x4*	C.A.S.	108	.....	Hoo	Fir	....
Vim 28	2250	1350	Own	3 x4½	14.4	L	T	MoC	B	Zen	G	AtK	...	C	Selec	3	U	Spic	W	Shel	5.5:1	.....	Shel	32x4½*	32x4½*	C.A.S.	127	.....	Hoo	Fir	....
1200 Pounds																		**1200 Pounds**													
Overland	2179	....	Own	4⅛x4½	27.2	L	T	C	B	Till	...	Con	L	C	Selec	3	....	Own	S	¾-Fl	.....	.....	S-El	33x4½*	33x4½*	Own	106	.....	.....	.....	68.3
1500 Pounds																		**1500 Pounds**													
Atlas 20	2320	1260	Lyco	3½x5	19.6	L	T	H	S	Sheb	...	AtK	R	B	Selec	3	....	Arv	B	Hess	.....	.....	Row	32x4½*	32x4½*	CAS	118	.....	.....	.....	60
Dispatch G	2200	1200	Wis	3¾x5	22.5	L	T	C	F	Rayf	...	Bos	...	O	Own	4	....	Bld	C	Dead	.....	.....	Tut	34x4*	34x4*	W	120	.....	.....	.....	50
G.M.C. 16	2940	....	Cont	3¾x5	22.5	L	C	McC	S	Mar	G	Eis	...	D	Selec	3	U	UM	B	WM	6:1	21.9:1	Det	35x5*	35x5*	Jac	132	Mon	.....	Bak	67
International H	2800	1750	Own	3½x5¼	19.6	L	C	Own	B	Holl	G	Bos	O	D	Own	3	A	Own	I	Own	7:1	25:1	.....	36x3	36x3½	Own	115	Own	Own	Fir	50
Marshall	....	895	Lyco	3¼x5	16.9	...	T	C	...	...	...	...	...	H	Selec	3	U	.....	...	Flot	.....	.....	Cant	30x3½	30x3½	W	112	.....	.....	Fir	....
Oldsmobile	2324	1350	Own	3 11x5¼	21.7	I	C	Own	B	Zen	V	AuL	L	C	Selec	3	U	Hart	I	Torb	6.5:1	38.87:1	S-El	35x5	35x5	W	128	.....	AuW	Jax	73
Rainier R11	2350	1850	Cont	3½x5	19.6	L	T	Har	...	Zen	V	Sim	...	D	B-Li	3	....	Hart	W	Timk	7.2:1	23.9:1	Per	34x4½	34x4½	Lav	125	Mon	Sch	Fir	80
Reo F	2525	1285	Own	4 ½x4½	27.2	L	C	Own	S	John	G	Rem	R	O	Own	3	....	Own	B	Own	4.6:1	17.2:1	Penn	34x4½*	34x4½*	Own	128	.....	Pru	Fir	62.5
Shaw M-2	2400	1975	Cont	3¾x5	22.5	L	T	T	B	Zen	G	Bos	...	D	B-Li	3	U	Spic	G	Timk	4.9:1	16.31:1	Per	32x4*	32x4*	Gem	116	.....	Stn	Fir	65
Stewart 11	2190	1350	LeRoi	3½x4½	15.6	L	T	T	B	Zen	G	Eis	D	B	Durst	3	U	Hart	I	Cl	6:1	18.06:1	Det	32x4	32x4	CAS	110	.....	Wan	Fir	66.7
Texan	2500	1340	Lyco	3½x5	19.6	L	T	H	B	Cart	V	Del	D	B	GLee	3	....	UP	B	Flot	4.25:1	18.6	S-El	33x4	33x4	CAS	112	.....	.....	Fir	60
White 15	2960	2400	Own	3¾x5 ½	22.5	L	C	C	B	Own	G	Mag	...	D	Selec	4	A	Own	B	Own	.....	.....	.....	34x4½*	34x4½*	Own	133	.....	.....	Fir	70
White Hickory E	....	....	Cont	3¾x5	22.5	L	C	T	B	Strm	V	Eis	...	F	Full	3	U	M&E	W	Timk	6.2:1	18.6:1	Shel	34x4½*	34x4½*	Lav	124	Simp	Bim	Fir	....
1 Ton																		**1 Ton**													
Acason B	3650	2100	Wau	3¾x5¼	22.5	L	P	Can	S	Sheb	G	Eis	...	F	Full	3	U	Bld	W	Timk	8.25:1	33:1	Det	36x3½	36x5	Ross	142	Wau	Bim	.....	73
Acme B	3376	2075	Cont	3¾x5	22.5	L	T	GO	B	Rayf	V	Eis	G	B	Cott	3	U	Bld	W	Timk	7.75:1	31:1	Det	34x3½	34x5	Ross	130	Dup	Bim	.....	80
All-American A	2600	1495	H-Sp	3¼x5	16.9	L	T	Stan	B	Strm	G	Sim	...	B	GLee	3	....	UP	I	Torb	8:1	18:1	Det	33x4*	32x4	Ross	130	Pier	Stn	Gyd	75
Apex C	2870	1750	Buda	3½x5½	19.6	L	T	Can	P	Strm	V	AuL	Q	F	Full	3	U	UP	I	Torb	6.5:1	19.5:1	Det	33x4*	32x3½	Lav	130	.....	.....	Fir	70
Beck-Hawkeye A	2800	1650	Cont	3¾x5	22.5	L	T	Har	S	Strm	G	Bos	...	F	Full	3	....	Bld	I	Cl	6:1	2.5:1	Hig	34x3½	34x5	Lav	124	Pier	Hay	Fir	75
Belmont A	2000	1150	GBS	3¾x4¼	22.5	L	T	GO	S	Zen	G	Con	D	P	Selec	3	U	Ster	B	¾-Fl	5.25:1	15.75:1	S-El	31x4*	31x4*	Lav	113	.....	E&O	Stn	60
Bessemer G	2900	1600	Cont	3½x5	19.6	L	T	C	B	Zen	...	Bos	...	F	Full	3	....	Arv	I	Torb	.....	.....	Per	34x3½	34x4	Ross	124	.....	.....	.....	57
Bethlehem K	2660	1495	Own	3½x5	19.6	L	T	Liv	...	Strm	G	Bos	G	B	Det	3	U	Spic	...	Stan	6:1	19.2:1	Math	34x1½	35x5	Ross	125	.....	Wan	Fir	65
Briscoe T34	2958	1495	Own	3½x5	18.2	L	C	Buic	G	Bat	L	C	Own	3	UM	I	Russ	8.2:1	23.4:1	S-El	33x4	34x4	Lav	121	.....	Hay	Jax	....
Chevrolet T	2840	1325	Own	3 11x5¼	21.7	I	C	Har	B	Zen	...	Rem	L	C	Warn	3	....	Arv	W	½-Fl	.....	.....	Hess	33x4*	35x5*	Warn	125	Mon	.....	.....	....
Clydesdale 32X	3400	2185	Cont	3¾x5	22.5	L	T	T	S	Zen	G	Bos	...	L	B-Li	3	U	Spic	W	Stan	7.5:1	24:1	Stan	34x3½	34x5	Ross	144	Own	.....	.....	72
Collier 18	....	1650	Cont	.....	19.6	...	..	.....	S	.....	...	.....	...	F	Full	..	....	.....	W	Own	.....	.....	.....	34x4	34x5	.....	140	Mon	.....	.....	..
Columbia F	2800	1750	Cont	3¾x5	22.5	L	C	T	B	Shk	G	Dix	...	B	Covt	3	U	Spic	I	Russ	7.5:1	21:1	Per	34x3½	34x5	Own	125	Pier	StM	Fir	70
Commerce E	2900	1590	Cont	3¾x5	22.5	L	T	L	S	Zen	V	Eis	I	C	Selec	3	U	Spic	I	Torb	7:1	22.9:1	Det	35x5	35x5	Jac	126	.....	Bim	Fir	80
Conestoga 20	3300	2100	Cont	3½x5	19.6	L	T	EM	S	Strm	G	Sim	...	F	Full	3	U	Ster	W	Wis	7.75:1	23:1	S-El	34x3½	34x5	Ross	128	.....	E&O	Stn	90
Corbitt H	3250	2200	Cont	3¾x5	22.5	L	T	McC	B	Strm	V	Eis	...	D	B-Li	3	U	Hart	W	Shel	6.5:1	19.5:1	Shel	34x3½	34x4	Ross	130	Simp	Bim	Fir	75
Dart H	3200	2100	Buda	3¾x5¼	22.5	L	T	C	F	Zen	V	Eis	...	F	Full	3	U	Spic	W	Own	7:1	20.3:1	Per	34x3½	34x5	Ross	130	Pier	Pru	.....	80
Day-Elder A	3250	1925	Cont	3½x5	19.6	L	T	Bus	B	Zen	G	Eis	...	D	Covt	3	U	Hart	W	Wis	7.75:1	28.3:1	Shel	34x3	34x4	Ross	128	.....	Jon	Stn	70
Diehl A	2400	1575	Cont	3¼x5	19.6	...	T	H	B	Zen	G	Sim	...	B	Durst	3	....	K-B	I	Torb	5.33:1	3.5:1	Mar	34x4½*	35x5*	Jac	115	.....	Sch	Fir	90
Denby 12	3100	1950	Cont	3½x5	19.6	L	T	Lng	B	Strm	G	Eis	...	F	Full	3	U	U-P	I	Russ	8.2:1	26.2:1	Det	35x5	36x6	Ross	124	Mon	Hay	.....	73

| | | |

1½ Ton—Continued

Model	Chassis Weight	Chassis Price	Engine—4 Cyl. unless otherwise noted	Bore and Stroke	Horsepower	Valve Arrange't	How Cooled	Radiator Make or Type	Lubrication	Carburetor	Fuel Feed	Ignition System	Engine Starter	Clutch	Transmission	Speeds Forward	Location of Transmission	Universal	Final Drive	Rear Axle	Total Gear Reduction in High	Total Gear Reduction in Low	Springs	Front Tires	Rear Tires	Steering Gear	Wheelbase	Governor	Wheels—Make	Rim Equipment	Pr. Cent of Weight on Rear Wheels
G.M.C. 31A	4205	....	Cont	3¾x5	22.5	L	C	McC	P	Mar	G	Eis	...	D	Selec	4	U	Own	W	Timk	9.25:1	37.5:1	Det	36x3½†	36x5	Jac	130	Mon	Own	SAE	74
G.M.C. 31B	4245	....	Cont	3¾x5	22.5	L	C	McC	P	Mar	G	Eis	...	D	Selec	4	U	Own	W	Timk	9.25:1	37.5:1	Det	36x3½†	36x5	Jac	144	Mon	Own	SAE	74
Graham Br's. Speed Truck	3400	2295	Cont	3¾x5	22.5	L	T	Lng	B	Strm	G	Eis	Q	F	**Full**	3	U	**K-B**	I	**Torb**	7:1	28:1	S-El	35x5*	36x6	Lav	133	Mon	.....	.....	80
Gramm-Bernstein 15	3950	2095	Cont	3¾x5	22.5	L	T	T	S	Strm	G	NE	...	D	Selec	3	U	Own	I	Cl	7.22:1	21.6:1	.....	36x3½	36x5	Ross	138	.....	.....	Fir	....
Gramm-Bernstein 65	4200	2500	Cont	3¾x5	22.5	L	T	T	S	Strm	G	NE	...	D	Own	3	A	Own	W	Stan	7.22:1	26:1	.....	36x3½	36x5	Ross	138	.....	.....	Fir	....
Grant 10	3000	1885	Cont	3¾x5	22.5	L	T	Fed	B	Cart	V	Spl	...	D	GLee	3	U	Arv	I	Torb	7:1	.....	Per	34x4½*	34x5	Jac	124	.....	Bim	Fir	65
Grant 11	3100	1935	Cont	3¾x5	22.5	L	T	Fed	B	Cart	V	Spl	R	B	GLee	3	U	Arv	I	Torb	7:1	.....	Per	34x4½*	34x5	Jac	140	Pier	Bim	Fir	67
Hahn CD	4800	....	.....	4½x5	27.2	L	T	C	F	Zen	G	Bos	...	F	Full	3	U	Arv	W	Shel	7.75:1	23.25:1	Shel	34x3½	34x5	Ross	130	Pier	.....	.....	65
Harvey WEA	3850	2350	Buda	4½x5½	27.2	L	C	C	F	Zen	G	Bos	...	F	Full	3	U	Hart	I	Cl	7.6:1	22.8:1	Det	34x3½	34x5	Ross	128	Mon	StM	.....	80
Hawkeye K	3750	1995	Buda	3¾x5½	22.5	L	P	Per	B	Zen	V	Eis	L	F	Full	3	U	Bld	W	Shel	7.75:1	31:1	Per	36x6	36x6	Ross	148	Simp	Bim	Fir	70
Higrade B 20	3300	2500	.....	4¼x5¼	27.2	L	P	Can	B	Sheb	V	Dix	...	F	**Full**	3	U	Arv	W	Shel	7.8:1	23.4:1	Shel	34x4	34x5	Lav	132	Pier	E&O	Fir	....
Hoover 20A	3150	2150	Cont	3½x5	19.6	L	T	C	F	Zen	G	Dix	...	F	Full	3	U	.....	W	Stan	8.67:1	8:1	Per	34x3½	34x6	Lav	140	.....	Roy	Fir	85
Huffman B	3200	1895	Cont	3¾x5	22.5	...	C	C	F	Zen	G	Dix	I	F	Full	3	U	.....	W	Torb	12.17:1	11.5:1	Per	34x3½	34x6	Lav	140	.....	Roy	Fir	85
Huffman C	3350	1695	Buda	3¾x5½	22.5	...	C	Own	B	Flch	G	Eis	I	F	Full	3	U	.....	W	Hind	.....	.....	Per	34x4	34x5	Ross	148	Dup	Wan	.....	85
Hurlburt	4300	2850	Buda	4 x5½	25.6	L	T	C	B	Strm	V	Bos	...	M	B-Li	3	U	.....	C	Russ	8.2:1	.....	GC	35x5*	38x7*	Lav	135	.....	StM	Fir	75
Indepen't E, Dav'n't, Ia	3550	2040	Cont	3¾x5	22.5	L	C	Own	B	Hall	G	Bos	O	F	Full	3	U	Bld	C	Own	9:1	30:1	.....	36x3½	36x5	Own	128	Own	Own	Fir	50
International K	3400	2300	Own	3½x5¼	19.6	L	C	Own	B	Strm	V	Bos	N	E	B-Li	3	U	Arv	I	Cl	7.2:1	4:1	Per	36x3½	36x5	Jac	144	.....	.....	.....	75
Jumbo 15	3600	2595	Buda	3¾x5¼	22.5	L	C	Hvn	B	Strm	G	Con	N	D	Full	4	A	Acme	W	Wis	8.5:1	41:1	Shel	34x4	34x5	Ross	144	Pier	Bim	.....	....
Kalamazoo G	4450	2600	Cont	3¾x5	22.5	L	P	Own	...	Zen	G	Eis	W	F	Covt	3	A	Own	C	Dead	8.66:1	31.58:1	Per	36x3½	36x6	Gem	144	Pier	StM	.....	89
Kelly-Springfield K31	4590	3000	Own	3¾x5¼	22.5	L	T	Fed	F	Strm	G	Eis	W	C	Covt	3	A	Spic	W	½-Fl	8.66:1	31.58:1	Per	36x3½	36x6	Gem	144	Pier	StM	.....	89
Kelly-Springfield K32	4685	3000	Own	3¾x5¼	22.5	L	C	Fed	F	Zen	G	Eis	...	F	B-Li	4	A	Spic	W	Shel	6.5:1	26:1	US	36x3½	36x5	Lav	144	Dup	.....	.....	80
Kimball A	4500	3070	Wis	4 x6	25.6	L	C	Fed	B	Zen	G	Eis	...	W	Warn	3	A	Spic	W	Shel	7.8:1	28.5:1	Math	36x3½	36x5	Jac	152	Pier	Pru	.....	69
Kissel General Utility	3890	2475	Own	3½x5½	24.1	L	C	McC	S	Strm	V	Eis	...	W	B-Li	3	U	.....	W	Shel	7.66:1	25.5:1	Mer	34x3½	34x5	Ross	138	Simp	Hoo	.....	....
Kleiber A	.....	2800	Cont	4½x5¼	27.2	...	C	.....	...	Strm	G	Bos	...	L	B-Li	3	U	Spic	W	Timk	7:1	23.52:1	Mer	36x4	36x5	Ross	150	Pier	Sch	Gdy	70
Larrabee-Deyo U	3600	2250	Cont	3¾x5	22.5	L	C	Bus	S	Sheb	G	Bos	...	L	B-Li	3	U	Bld	C	Own D	6.99:1	28.01:1	Mer	36x4	36x3½†	Gem	Q	Own	Sch	.....	68
Maccar L	4300	2825	Cont	4½x5¼	27.2	L	C	Own	B	Strm	G	Bos	...	L	B-Li	3	U	Spic	W	Timk	8.5	34.09:1	Mer	36x4	36x3½†	Gem	Q	Own	Sch	.....	68
Mack AB	4800	3000	Own	4 x5	25.6	L	C	Own	S	Zen	G	Aer	...	L	B-Li	4	U	Spic	W	Timk	7.75:1	23.25:1	Det	34x3½	34x5	Ross	142	McC	Pru	.....	78
Mack AB	4900	3000	Own	4 x5	25.6	L	C	Own	S	Zen	G	Aer	...	L	B-Li	4	U	Spic	I	Torb	8:1	24:1	Det	34x3½	34x5	Ross	142	McC	Pru	.....	78
Master JW	3800	2390	Buda	4½x5½	27.2	L	C	T	S	Mas	G	Eis	...	D	Full	3	U	Spic	W	Timk	7.75:1	23.25:1	Det	34x3½	34x5	Ross	142	McC	Pru	.....	78
Master JI	3900	2490	Buda	4½x5½	27.2	L	C	T	S	Mas	G	Eis	...	D	Full	3	U	Spic	W	Timk	7.75:1	23.25:1	Det	34x3½	34x5	Ross	142	McC	Pru	.....	78
Maxwell	2385	1185	Own	3⅝x4½	21	...	C	T	B	John	G	AtK	...	C	Selec	3	U	Own	W	½-Fl	7.25:1	34.4:1	Shel	32x3	32x4	Own	124	.....	Kel	Fir	50
Maxwell	2385	1205	Own	3⅝x4½	21	...	C	T	B	John	G	AtK	...	C	Selec	3	U	Own	W	½-Fl	7.25:1	34.4:1	Shel	32x3	32x4	Own	124	.....	Kel	Fir	50
Maxwell	2385	1225	Own	3⅝x4¼	21	...	C	T	B	John	G	AtK	...	C	Selec	3	U	Own	W	½-Fl	7.25:1	34.4:1	Shel	34x4½*	34x4½*	Own	124	.....	Kel	Fir	50
Maxwell	2385	1287	Own	3⅝x4½	21	...	C	T	B	John	G	AtK	...	C	Selec	3	U	Own	W	½-Fl	7.25:1	34.4:1	Shel	34x4½*	34x5	Own	124	.....	Kel	Fir	50
Maxwell	2385	1350	Own	3⅝x4½	21	...	C	T	B	John	G	AtK	...	C	Selec	3	U	Own	W	½-Fl	7.25:1	34.4:1	Shel	35x5	35x5	Own	124	.....	Kel	Fir	50
Menominee H	.....	2725	Cont	3¾x5½	22.5	L	C	Own	S	Mill	G	Eis	...	F	Selec	3	U	Spic	W	Timk	9.25:1	23.3:1	Tut	36x3½	36x5	Ross	144	Mon	Stn	Fir	80
Moreland 20B	4150	2930	Cont	4½x5¼	27.2	L	C	T	S	Strm	G	Dix	...	D	Selec	4	U	Ther	W	Timk	7:1	33.88:1	US	36x3½	36x5	Ross	126	.....	Smi	SAE	....
Myers 80	3000	1875	Lyco	3½x5	19.6	I	C	T	S	Zen	G	Sim	...	B	GLee	3	U	UM	W	Chic	8.5:1	32:1	C-C	34x3½	34x5	CAS	144	.....	E&O	.....	....
Napoleon 11	3450	1860	Vict	3½x5	19.6	I	C	T	F	Strm	G	Con	L	F	Full	3	U	UP	I	Cl	8:1	24:1	S-El	35x5*	36x6*	Lav	133	.....	.....	Fir	75
Nelson & LeMoon F1½	3400	2425	Cont	4½x5¼	27.2	L	C	T	S	Strm	G	Bos	W	L	B-Li	3	U	Own	W	Timk	7:1	2:1	Tut	36x3½	36x6	Lav	...	Pier	Pru	Gdy	65
Noble B-30	4200	....	Buda	3¾x5¼	22.5	L	T	C	...	Strm	G	Eis	...	F	Full	3	U	M&E	W	Shel	7.75:1	31.1:1	S-El	36x3½	36x5	Lav	156	Pier	Bim	Fir	80
Norwalk	1850	1925	Lyco	3½x5	19.6	L	T	C	B	Zen	...	Del	...	B	GLee	3	....	UM	W	Stan	.....	.....	C-C	34x3½	34x5	CAS	130	.....	.....	.....	85
O.K. 1½ T	.....	2450	Buda	4½x5½	27.2	L	C	Own	B	Zen	...	Eis	...	F	Full	3	....	.....	W	Wis	.....	.....	Tut	36x3½	36x5	Ross	146	Pier	.....	.....	75
Old Reliable A	4150	2350	Wis	4 x5	25.6	L	P	T	B	Strm	V	Bos	Q	M	B-Li	3	U	Spic	W	Shel	7.75:1	24.94:1	Shel	34x3½	36x6	CAS	130	.....	.....	.....	....
Oneida B9	5025	2750	Own	4x4¼	25.6	L	C	Own	P	Strm	...	Mag	...	D	Own	3	A	Own	W	Own	8.25:1	33:1	S-El	36x3½	36x6	Ross	146	Pier	.....	.....	....
Packard 1¾E	4670	3200	Own	4 x5½	25.6	L	C	T	F	Strm	V	Dix	B	D	Selec	4	A	Spic	W	Flot	6.25:1	28.7:1	.....	34x3½	34x3½†	Ross	138	Pier	StM	.....	90
Paige 52-19	4000	2680	Hink	4 x5¼	25.6	L	C	Own	F	Strm	V	Bos	Q	D	Selec	4	A	Spic	W	Timk	8.25:1	37.51:1	Per	34x3½	34x5	W	144	Own	.....	.....	....
Patriot Lincoln	3900	2650	Hink	4 x5¼	25.6	L	C	Own	F	Strm	V	.....	...	D	Selec	4	A	Ther	W	Emp	7.25:1	34.8:1	S-El	34x3½	34x3½†	Own	144	Own	.....	.....	46.2
Piedmont	3000	1785	Lyco	3½x5	19.6	L	T	Stan	F	Cart	V	Bat	D	B	Selec	3	A	Hart	W	Emp	1.97:1	4.32:1	S-El	.....	34x3½†	Ross	140	Hink	.....	Fir	80
Pioneer N	.....	1990	Cont	3¾x5	22.5	...	T	C	T	Strm	G	Bos	...	D	B-Li	3	A	.....	W	Timk	.....	.....	.....	36x3½	36x5	Dit	140	.....	.....	Fir	....
Rainier R-6	3100	2150	Cont	3½x5	19.6	L	T	Har	B	Zen	V	Sim	...	D	B-Li	3	A	Hart	W	Shel	7.8:1	25.97:1	Per	34x3	34x4	.....	154	.....	.....	.....	....
Republic 11X	3365	2050	Cont	4 x5½	25.6	L	T	H	B	Strm	G	Eis	...	F	Full	3	U	Peters	E	Badg	6.6:1	19.8:1	Shel	36x3½	36x5	Lav	133	Mon	Sch	.....	80
Reynolds 1½	....	3150	.....	4x5¼	25.6	L	C	Own	B	Strm	G	Eis	...	D	Full	4	A	Hart	I	Torb	8:1	23:1	S-El	34x3½	34x5	Ross	150	Pier	Bim	Gdy	90
Rowe CW	....	2800	Wis	3¾x5	22.5	L	C	Fed	F	Strm	G	Mag	...	...	Own	4	A	.....	W	Own	7.75:1	36.81:1	S-El	36x3½	36x6	Jac	144	Rug	Pru	Fir	....
Royal	....	2800	Wis	3¾x5	22.5	L	C	T	B	Zen	G	Bos	Q	L	**B-Li**	4	U	**Spic**	W	**Shel**	.....	.....	**Shel**	36x6*	36x6*	Own	144	Hink	Smi	.....	80
Sandow CG	3300	2290	Cont	3¾x5	22.5	L	C	T	B	Strm	G	Bos	Q	D	Own	3	U	Own	W	Timk	.....	.....	Mer	34x4	34x5	Ross	...	Simp	Hoo	.....	....
Schwartz	3500	2385	Cont	3¾x5	22.5	L	T	Fed	B	Strm	G	Eis	...	D	Full	3	U	Spic	W	Shel	7.8:1	23:1	GC	34x3½	34x5	Ross	128	.....	.....	.....	67
Schwartz B	3500	2625	Cont	3¾x5	22.5	L	T	Fed	B	Strm	G	Bos	...	L	B-Li	3	U	Hart	I	Torb	.....	.....	Row	34x3½	34x5	Ross	135	.....	Stn	.....	70
Selden 1½A	3400	2240	Cont	3¾x5	22.5	L	T	Bus	F	Strm	G	Bos	...	L	B-Li	3	U	Hart	I	Torb	7.6:1	25.5:1	Row	36x6*	36x6*	Ross	140	Pier	.....	.....	....
Service 31	4850	2290	Buda	4 x5½	25.6	L	T	T	F	Strm	G	Eis	N	L	B-Li	3	U	Spic	W	Timk	7.75:1	.....	Per	34x3½	34x5	Ross	140	Pier	Sch	.....	....
Service 36	4900	3415	Buda	4¼x5½	28.9	L	C	T	F	Strm	G	Eis	...	D	Selec	4	A	Spic	W	Timk	7.75:1	37.5:1	.....	36x3½	36x6	Lav	140	Pier	Arc	Gdy	70
Signal H	4670	2850	Cont	4⅛x5¼	27.2	L	C	McC	B	Strm	G	Eis	...	D	Selec	4	A	Spic	W	Timk	6.8:1	32.9:1	.....	35x5*	38x7*	Ross	150	Simp	Bim	.....	65
Sterling 1½	4720	2850	Ster	4 x5¾	25.6	L	C	Own	P	Strm	G	Eis	...	L	B-Li	4	A	Spic	W	Timk	9.25:1	37:1	Det	34x4	36x6	Ross	150	Simp	Bim	.....	65
Stewart 9	3440	2250	Cont	3¾x5	22.5	L	T	Own	B	Ray	V	Eis	...	L	B-Li	4	A	Spic	W	Timk	7:1	28:1	Math	36x3½	36x5	Ross	146	Pier	Hay	Gdy	75
Stoughton B	.....	.....	.....	3¾x5¼	22.5	...	C	.....	B	Zen	G	Eis	...	F	Full	3	U	Hart	I	Cl	7.6:1	22.8:1	Det	34x3½	34x5†	Ross	142	Wan	Wan	.....	91
SullivanF	3500	2350	Buda	3¾x4½	22.5	L	C	T	C	Strm	G	Eis	...	D	B-Li	3	U	.....	W	Shel	7.8:1	.....	S-El	36x3½	36x5	Gem	140	.....	Wan	Fir	70
Texan TK39	3200	1425	Lyco	3½x5	19.6	L	T	C	F	Strm	G	Bos	...	H	Covt	3	A	Hart	W	Timk	8.5:1	31:1	Mer	36x3½	36x5	.....	140	.....	Own	Gdy	....
Tiffin GW	3750	2415	Cont	4½x5¼	27.2	L	C	T	B	Cart	V	Del	D	B	Mune	3	U	UP	W	½-Fl	7.75:1	20.15:1	S-El	34x4	34x4	Ross	129	.....	Wan	.....	60
Tower J1½	3900	2700	Cont	4½x5¼	27.2	L	C	T	B	Sheb	G	Bos	...	F	Full	3	U	Hart	W	Shel	7.75:1	23.25:1	Kal	36x3½	36x5	CAS	130	.....	.....	Fir	60
Transport 30	3450	2050	Cont	3¾x5	22.5	L	C	T	S	Strm	...	Bos	...	F	Full	3	....	Spic	W	Timk	.....	.....	Det	35x5*	38x7*	Ross	129	Pier	Smi	.....	....
Triangle A	3750	2185	Wau	3¾x5¼	22.5	L	C	Per	S	Strm	G	Eis	...	F	Full	3	U	Hart	I	Cl	7.6:1	30.4:1	Det	36x3½	36x5	Ross	142	Pier	.....	.....	70
Triumph H	3650	2450	Buda	3¾x5¼	22.5	...	C	H	F	Bent	V	Dix	...	B	Cott	3	U	Hart	...	Russ	6.83:1	21:1	Det	34x3½	34x6	Jac	140	Simp	.....	Fir	70
																					.....	8:1	S-El	36x3½	36x6	Gem	144	Wau	Roy	Fir	60
																										Lav	144	Pier	Stn	Stn	70

1½ Ton—Continued

| | | |

Model	Chassis Weight	Chassis Price	Engine—4 Cyl. unless otherwise noted	Bore and Stroke	Horsepower	Valve Arrange't	How Cooled	Radiator Make or Type	Lubrication	Carburetor	Fuel Feed	Ignition System	Engine Starter	Clutch	Transmission	Speeds Forward	Location of Transmission	Universal	Final Drive	Rear Axle	Total Gear Reduction in High	Total Gear Reduction in Low	Springs	Front Tires	Rear Tires	Steering Gear	Wheelbase	Governor	Wheels—Make	Rim Equipment	Pr. Cent of Weight on Rear Wheels

2 Ton—Continued

2 Ton—Continued

Pierce-Arrow X4	6150	4300	Own	4 x5½	25.6	T	P	T	F	Own	G	Dix	...	C	Selec	4	A	Own	W	Flot	7:1	37.08:1	S-El	36x4	36x4†	Own	150	Own	Own	Own	70
Pioneer F	....	2390	Cont	4 1/16x5¼	27.3	...	...	.....	...	Strm	V	Eis	...	...	B-Li	4	A U	.....	W	Timk	.....	.....	.....	36x4	36x7	....	164	.....	.....	.....	.....
Rainier R8	3600	2650	Cont	3¾x5¼	22.5	L	P	Har	B	Zen	V	Sim	...	D	B-Li	3	U	Hart	W	Shel	8.66:1	28.83:1	Per	34x4	34x6	Ross	147	Mon	Sch	.....	80
Rowe CDW	4500	3300	Wis	4 x5	32	L	C	Fed	F	Zen	G	Bos	...	L	B-Li	4	U	Spic	W	Shel	7.75:1	11.75:1	Shel	34x4	36x4†	Ross	142	Simp	Hoo	.....	53
Royal	....	3200	Wis	4 x5	25.6	...	C	.....	...	Strm	...	Bos	Q	B	Own	...	...	Own	W	Timk	.....	.....	Mer	36x4½	36x6	Ross	...	Mon	.....	.....	.....
Sandow I	3800	2475	Cont	3¾x5	22.5	L	P	T	...	Strm	G	Eis	...	D	Full	3	U	Spic	I	Torb	10:1	30:1	GC	36x4	36x6	Ross	150	.....	Stn	.....	70
Schacht	5500	3350	Buda	4¼x5½	28.9	L	P	T	B	Strm	G	Eis	...	H	Own	3	A U	Flex	W	Own	.....	.....	Nat	36x4	36x7	Own	144	Dup	StM	.....	70
Schwartz C	4000	2850	Cont	4 1/16x5¼	27.2	L	P	Own	B	Sheb	G	Bos	...	D	Full	3	U	Spic	I	Torb	9.1:1	36.49:1	Row	36x4	36x7	Ross	146	Pier	Sch	.....	.....
Schwartz 2C	4000	2850	Cont	4 1/16x5¼	27.2	L	P	Fed	B	Strm	G	Bos	...	H	Own	3	A U	Flex	W	Own	.....	.....	Row	36x4	36x7	Ross	132	Pier	Sch	.....	.....
Selden 2½A	5400	3290	Cont	4 1/16x5¼	27.2	L	P	Fed	B	Strm	...	Bos	...	L	B-Li	3	....	Hart	I	Torb	.....	.....	Per	36x4	36x7	Gem	145	Pier	Arc	.....	70
Signal J	5010	3200	Cont	4 1/16x5¼	27.2	L	P	Bus	B	Strm	G	Bos	...	L	B-Li	4	A U	Spic	W	Timk	7.75:1	37.5:1	Det	34x4	36x8	Ross	150	Pier	Hay	Gdy	80
Sterling 2	5300	3100	Ster	4 x5¼	25.6	L	C	Own	B	Strm	G	Eis	...	L	B-Li	4	A U	Spic	W	Timk	9.25:1	37:1	Math	36x4	36x6	Ross	142	Wau	Wan	.....	91
Stewart 7	4460	2875	Cont	4½x5¼	27.2	L	C	Rayf	V	Eis	...	Bos	...	L	B-Li	4	A U	Spic	W	Timk	7.7:1	37.26:1	Det	34x4	34x7†	Ross	156	Pier	Wan	Fir	72
Stoughton D	....	....	....	4 x5½	25.6	...	C	T	B	Zen	G	Eis	...	F	Full	3	U U	Hart	I	Cl	9:1	27:1	S-El	36x4	36x7	.....	140	.....	Own	Gdy	....
Sullivan E	4500	3150	Buda	4 1/16x5½	27.2	L	P	Own	B	Strm	G	Eis	...	D	B-Li	3	U U	.....	W	Shel	8.75:1	.....	Shel	36x4	36x7	Ross	150	.....	Wan	.....	71
Sullivan EL	4500	3175	Buda	4 1/16x5½	27.2	L	P	V	F	Strm	V	Bos	...	L	B-Li	3	U U U	Spic	W	Timk	7.75:1	26:1	Shel	36x4	36x7	Ross	168	.....	.....	.....	71
Superior E	3600	2450	Cont	4 1/16x5½	27.2	L	P	V	F	Strm	V	Bos	...	L	B-Li	3	U U U	Spic	W	Timk	7.75:1	26:1	Shel	36x4	36x7	Ross	144	Pier	Sch	Fir	75
Traffic	3175	1395	Cont	4 1/16x5¼	27.2	L	P	Idl	G	Strm	V	Eis	...	F	Full	3	U U U	Arv	I	Torb	9:1	23.2:1	Tut	36x4	36x6	Ross	144	Pier	Sch	Fir	85
Transport 50	4250	2585	Cont	3¾x5	22.5	L	P	C	B	Cart	G	Bos	...	C	Covt	3	U U U	Ther	I	Russ	8.2:1	29.68:1	Det	34x3½	34x5	Own	132	.....	Roy	Fir	75
Triangle C	4200	2485	Wau	3¾x5	22.5	L	P	C	B	Strm	G	Eis	...	F	Full	3	U U U	Hart	I	Cl	8.15:1	39:1	Det	36x4	36x7	Jac	150	Dup	.....	Fir	85
Triumph 2	4900	2950	Buda	4¼x5½	22.5	...	C	Per	B	Strm	G	Eis	...	F	Full	3	U U U	UP	I	Cl	8:1	24:1	Det	36x4	36x6	Gem	146	Wau	Roy	Fir	70
Vim 22	4700	3150	Her	3¾x5½	22.5	...	C	H	S	Strm	V	Dix	...	B	Cott	3	U U	Hart	I	Russ	.....	8:1	S-El	36x4	36x3½†	Lav	144	Pier	Stn	Fir	60
Wells C-I	4400	2800	Cont	3¾x5½	22.5	L	C	McC	F	Zen	G	Dix	...	L	B-Li	4	U U	Spic	W	Shel	7.75:1	.....	Shel	36x4	36x6	Gem	142	Dup	Smi	.....	.....
White 20	4150	3300	Own	3¾x5½	22.5	L	G	T	B	Strm	...	Berl	D	D	Selec	4	A	Acm	I	.....	7:1	40:1	.....	36x4	36x8	Lav	168	Mon	Smi	Stn	82
Wichita M	4700	2750	Wau	3¾x5¼	22.5	L	C	Per	B	Own	G	Mag	...	C	Covt	3	A A	Own	W	Shel	10.66:1	38.9:1	.....	36x4	36x7	Own	157	.....	.....	Fir	70
Winther 49	5300	3000	Wis	4 x5	25.6	L	P	T	G	Strm	G	.....	...	D	Selec	4	A A	Own	R	Own	.....	.....	.....	36x4	36x6	Ross	144	Wau	Bim	Fir	80
Witt-Will P	4550	2950	Cont	4 1/16x5¼	27.2	I	G	C	B	Mas	V	Eis	B	B	B-Li	4	A A	Bld	I	Cl	9:1	39	Math	34x4	34x4	Ross	150	.....	Own	.....	80
										Zen	G	Eis	...	D	Selec	3	U	Spic	W	Timk	7.8:1	23.4:1	S-El	36x3½	36x7	Ross	144	Pier	Arc	SAE	70

2½ Ton

2½ Ton

Acason H	4354	3150	Wau	4¼x5¾	28.9	L	P	Can	S	Sheb	V	Eis	...	B	Cott	3	U	Bld	W	Timk	8.5:1	40.37:1	Det	36x4	36x7	Ross	150	Wau	Bim	.....	76
Ace 2½	5630	....	Buda	4¼x5½	28.9	L	C	Spi	F	Sheb	G	AtK	W	L	B-Li	4	A	Spic	W	Timk	7.75:1	8.5:1	Math	36x6*	40x8*	Ross	156	Pier	Day	Gdy	80
Apex E	4500	2450	Buda	4¼x5½	28.9	L	C	Can	P	Strm	V	Eis	Q	F	Full	3	U	UP	I	Torb	9:1	27:1	Det	36x4	36x6	Lav	150	Dup	.....	Fir	70
Armleder HW	4550	....	Cont	4 1/16x5¼	27.2	L	C	T	F	Zen	G	Bos	...	D	B-Li	3	U	Opt	W	Timk	8.5:1	34:1	Math	36x4	36x7	Ross	166	.....	StM	.....	80
Atterbury 7CX-LWB	5280	3475	Cont	4¼x5¼	27.2	L	C	T	S	Zen	G	Eis	...	L	B-Li	4	U U	Spic	W	Timk	9.25:1	37:1	SP	36x4	36x4†	Gem	171	Mon	Arc	Fir	92.5
Atterbury 7CX-STD	5120	3375	Cont	4 1/16x5¼	27.2	L	C	T	S	Zen	G	Eis	...	L	B-Li	4	U U A	Spic	W	Wis	8.66:1	34.66:1	Tut	36x4	36x4†	Gem	153	Mon	Arc	Fir	92.5
Available H2½	4750	3250	Cont	4 1/16x5¼	27.2	L	C	T	B	Strm	V	Bos	...	L	B-Li	4	...	Arv	I	Torb	.....	.....	Per	36x4	36x8	Ross	152	Pier	Sch	.....	90
Bessemer J-2	4500	2785	Cont	4 1/16x5¼	27.2	L	C	T	B	Rayf	...	Bos	...	B	B-Li	4	A	Spic	W	Timk	9.25:1	37:1	Per	36x4	36x4†	Ross	158	Pier	.....	.....	.....
Bethlehem E	3910	2365	Own	4 x4½	25.6	L	C	C	B	Sheb	G	Will	G	B	Det	3	U	UP	I	Russ	8.8:1	28.16:1	Shel	36x4	34x6	Lav	144	Mon	Wan	Fir	85
Betz D2	4750	2785	Buda	4¼x5½	28.9	L	C	Fed	B	Strm	...	Bos	...	B	B-Li	4	...	UM	W	Timk	.....	.....	Per	36x4	36x7	Ross	150	Pier	.....	.....	67
Brinton F	4600	3400	Cont	4 1/16x5¼	27.2	L	C	T	B	Strm	G	Bos	...	L	Selec	3	U	Spic	W	Flot	1:1	3.36:1	Shel	34x4	34x6	Ross	Q	Pier	Sch	.....	75
Brockway K4	4700	3200	Cont	4 1/16x5¼	27.2	L	C	Bus	B	Strm	G	Eis	...	L	B-Li	4	A U	Spic	W	Timk	8.5:1	34:1	S-El	36x4	36x6	Ross	152	Q	Hoo	.....	.....
Chicago C2½	4500	3100	Her	4 x5½	25.6	L	C	T	F	Strm	G	Eis	...	L	B-Li	4	A U	Peters	W	Timk	8.5:1	34:1	Mer	36x4	36x7	Gem	156	Simp	Q	Stn	80
Clydesdale 65X	4850	3175	Cont	4 1/16x5¼	27.2	L	C	T	F	Strm	G	Bos	...	L	B-Li	4	A	Spic	W	Timk	8.5:1	34:1	Math	36x4	36x7	Ross	163	Own	Smi	.....	73
Columbia G	4800	2750	Hink	4 x5¼	25.6	L	C	T	S	Zen	G	Bos	...	L	B-Li	4	A	Spic	I	Russ	9.5:1	.....	Per	36x4	36x7	Own	144	Hink	.....	.....	.....
Concord B	4600	3200	Buda	4¼x5½	28.9	L	C	T	S	Strm	G	Bos	...	B	Covt	3	A	Spic	W	Timk	8.5:1	34:1	Per	36x4	36x7	Ross	150	Mon	Arc	Fir	70
Corbitt B	5000	3500	Cont	4 1/16x5¼	27.2	L	C	T	S	Zen	G	Bos	...	L	B Li	4	A U	Spic	W	Timk	8.5:1	34:1	Shel	36x4	36x7	Ross	148	Simp	Bim	Fir	70
Dart M	4800	3000	Buda	4¼x5½	28.9	L	C	T	S	Strm	G	Eis	...	D	B-Li	4	A U	Hart	W	Shel	8.75:1	35:1	Per	36x4	36x8	Ross	150	Pier	Pru	.....	75
Day-Elder C	5300	2850	Buda	4¼x5½	28.9	L	C	McC	F	Zen	G	Eis	...	F	Full	4	U U	Spic	W	Own	8.5:1	38:1	Per	36x4	36x7	Ross	150	Mon	Jon	.....	72
DeKalb E2½	4800	2600	Cont	4¼x5½	28.9	L	C	Bus	F	Zen	G	Eis	...	D	Covt	3	U U	Hart	W	Wis	10.67:1	39.8:1	Shel	36x4	36x7	Ross	144	.....	Hay	.....	79.4
Denby 25	4790	3250	Cont	4 1/16x5¼	27.2	L	P	T	B	Mas	G	Eis	...	F	Full	4	U U	UP	I	Russ	9.45	45.3	Det	36x4	36x7	Ross	150	Mon	Smi	.....	79
Dependable E	5600	2750	Buda	4¼x5½	28.9	L	C	Lng	F	Strm	G	Eis	...	F	Full	4	U U	Acme	W	Wis	8.66:1	13.46:1	Per	36x4	36x7	Ross	157	Pier	Bim	Fir	70
Doane 1919	5000	3750	Wau	4¼x5½	28.9	L	C	C	F	Zen	V	Dix	...	F	Full	4	A	Arv	C	Dead	7.72:1	.....	.....	36x5	36x7	Lav	156	Wau	.....	.....	79
Douglas E	4500	2750	Buda	4¼x5½	28.9	L	C	Own	F	Mas	...	Bos	...	D	Selec	4	U	Arv	I	Torb	9:1	43:1	Own	34x4	36x7	Ross	155	Pier	.....	Gdy	65
Douglas F	4750	3025	Buda	4¼x5½	28.9	L	C	Own	F	Sheb	V	Eis	...	F	Full	4	...	Arv	W	Wis	.....	.....	Own	34x4	36x7	Ross	155	Pier	.....	.....	70
Erie 2½	5400	....	Buda	4¼x5½	28.9	L	C	Own	F	Sheb	...	Eis	...	F	Full	4	A	Spic	W	Shel	.....	.....	Per	34x4	36x6	Ross	150	Pier	Hoo	.....	80
Fageol 3400	4600	....	Wau	4¼x5¾	28.9	L	C	McC	B	Strm	G	Bos	...	D	Full	4	A	Spic	W	Timk	5.6:1	59.5:1	Math	34x4	36x7	Ross	144	Wau	Pru	.....	80
Gary J	4850	2950	Buda	4¼x5¾	28.9	L	C	Spi	S	Zen	G	Dix	...	B	B-Li	4	A U	Spic	W	Timk	8.5:1	41:1	S-El	36x4	36x7	Ross	148	McC	Pru	Gdy	.....
Gersix K	5200	3150	Buda	4¼x5½	28.9	L	C	T	F	Mas	G	Eis	...	B	Cott	3	A U	Spic	W	Timk	8.5:1	41:1	Tut	36x4	36x7	Ross	150	Mon	Jon	.....	75
Gramm-Bernstein 25	5300	3650	Hink	4¼x5½	28.9	L	C	Idl	F	Strm	V	Eis	...	D	Own	4	A	Bld	W	Own	9.66:1	39:1	Tut	36x4	36x7	Ross	150	Pier	Hoo	.....	80
Hahn EE	4800	....	....	4½	32.4	L	C	Own	F	Strm	...	Bos	...	D	B-Li	3	....	Spic	W	Timk	.....	.....	.....	36x4	36x4†	Ross	148	McC	Pru	Gdy	.....
Harvey WFA	5300	3300	Buda	4¼x5½	28.9	L	C	T	F	Zen	G	Eis	...	D	B-Li	4	A	Spic	W	Shel	7.75:1	31:1	Shel	36x4	36x8	Ross	150	Mon	.....	.....	.....
Hendrickson I	....	3200	Buda	4¼x5½	28.9	L	C	T	F	Strm	G	Dix	...	D	B-Li	4	A	Ther	W	Timk	7.75:1	37.2:1	S-El	36x4	36x7	Ross	145	Pier	.....	Fir	.....
Hewitt-Ludlow	4800	3300	Buda	4¼x5½	28.9	L	C	T	F	Strm	...	Bos	...	D	Full	4	....	Spic	W	Wis	.....	.....	.....	36x4	36x7	Ross	150	Mon	Sch	.....	80
Hurlburt 2½	5600	3750	Buda	4¼x5½	28.9	L	P	Own	F	Fich	G	Eis	...	M	B-Li	3	...	Hind	W	.....	.....	.....	Per	36x4	36x7	Ross	150	Q	McC	Stn	80
Indepen't H, Youngst'n, O	4600	....	Cont	4 1/16x5½	28.9	L	P	T	F	Strm	G	Eis	...	F	Full	3	U	Spic	W	Wis	9.66:1	39:1	S-El	36x4	36x7	Ross	170	Dup	Wau	.....	85
Indiana 25	5500	3150	Own	4¼x5¼	28.9	L	C	T	F	Sheb	G	Eis	...	B	Selec	4	A	Acme	W	½-Fl	7.75:1	.....	S-El	36x4	36x8	Ross	148	Pier	.....	.....	85
Jumbo 25	4800	3095	Buda	4 1/16x5½	27.2	L	P	T	F	Strm	G	Eis	...	F	Full	4	A U	Arv	I	Cl	9:1	4.84:1	S-El	36x4	36x8	Wohl	156	Pier	Bim	.....	71.5
Kankakee E	4200	2875	Cont 6	4¼x5½	28.9	L	C	Own	F	Zen	G	Eis	Q	B	Full	3	A	Russ	I	Cl	9:1	4.84:1	Det	36x4	36x7	Jac	152	Dup	Day	.....	75
Kelly-Springfield K35	5200	3500	Own	3½x5¼	29.4	L	P	H	F	Zen	G	Del	D	F	Full	4	A U	Acme	I	Russ	7.4:1	22.2:1	Tem	34x4	34x6	Ross	170	.....	Bim	Gdy	70
Kelly-Springfield K36	5540	3500	Own	3¾x5¼	22.5	L	C	Fed	F	Zen	G	Eis	W	D	Warn	3	U A	Own	C	Dead	10.64:1	35.11:1	Per	36x4	36x4†	Gem	144	Pier	Bim	.....	75
Kimball C	5100	3975	Wis	4¼x6	28.9	L	C	Flex	B	Zen	V	Eis	W	C	Covt	3	U A	Spic	W	½-Fl	10.33:1	34.02:1	Per	36x4	36x4†	Gem	144	Pier	StM	.....	89
													...	L	B-Li	4	A	Spic	W	Shel	7.75:1	37.31:1	US	36x4	36x7	Ross	Q	Dup	Sml	.....	80

Kleiber B.	.....	3800	Cont	4½x5½	32.4	...	...	.....	...	Strm	G	Bos	...	...	B-Li	..	U	.....	W	.....	39.8:1.	31:1	.....	36x4	36x8	Ross	160	.....	W&L	.....	.....						
Koehler M.	5050	3365	Her	4 x5⅛	25.6	L	C	T	P	Zen	G	Eis	...	D	B-Li	4	A	Spic	W	Timk	9.25:1	37:1	Math	36x4	36x7	Lav	162	Simp	Wan	SAE	75						
Larrabee-Deyo K.	5200	3250	Cont	4⅛x5¼	27.2	L	C	Bus	S	Sheb	G	Bos	...	L	B-Li	4	A	Q	W	Shel	8.75:1	35:1	Mer	36x4	36x7	Ross	176	Simp	Hoo	.....	.....						
L.M.C.	4500	2750	Cont	4⅛x5¼	27.2	L	C	T	S	Strm	P	Bos	R	B	Det	4	A	Mech	I	Russ	8.8:1	38.72:1	Math	36x4	36x4†	Lav	164	Pier	Bim	.....	80						
Maccar H.	5000	3500	Cont	4½x5½	32.4	L	C	Own	B	Strm	G	Bos	...	L	B-Li	3	U	Spic	W	Timk	7.75:1	31.08:1	Mer	36x4	36x4†	Ross	162	Pier	Sch	Fir	70						
Moreland 20C.	5380	3775	Cont	4½x5½	32.4	L	C	Own	B	Mill	G	Dix	...	D	Selec	4	A	Ther	W	Timk	6.8:1	32.9:1	US	36x4	36x7	Ross	144	.....	Smi	SAE	.....						
Netco H.	6500	3800	Cont	4½x5½	32.4	L	C	R-T	S	Zen	G	Eis	...	L	B-Li	4	A	Hart	W	Timk	7.75:1	39:1	Per	36x4	36x8	Ross	168	.....	Arc	SAE	75						
Noble D50.	5000	....	Buda	4¼x5½	28.9	L	C	T	...	Strm	G	Eis	...	F	Full	4	A	M&E	W	Shel	8.75:1	42:1	S-El	36x4	36x8	Lav	176	Pier	Bim	Fir	80						
Ogden B1.	5600	2995	Cont	4⅛x5¼	27.2	L	C	T	B	Rayf	G	Bos	...	B	B-Li	4	U	Acme	W	Timk	8.5:1	12.5:1	Tut	36x4	36x7	Lav	176	Pier	Stn	.....	70						
O.K. 2½T.	....	3150	Buda	4¼x5½	28.9	L	C	Own	B	Zen		Eis	...	F	Full	4	U	.....	W	Wis	.....	.....	Tut	36x4	36x7	Ross	150	Pier	.....	.....							
Old Reliable B.	5750	3500	Wis	4¼x6	28.9	L	C	T	B	Strm	V	Bos	...	D	Full	4	A	Spic	W	Shel	7.75:1	37.2:1	Shel	34x4	36x7	Ross	160	Mon	StM	.....	70						
Paige 50-18.	5200	3150	Cont	4⅛x5¼	27.2	L	C	T	B	Strm	G	Bos	...	D	Selec	4	A	Spic	W	Timk	8.5:1	40.88:1	Per	34x4	34x4†	Lav	150	Simp	Day	.....	80						
Patroit Washington.	5200	3650	Hink	4½x5½	32.4	L	C	Own	F	Strm	V	.....	...	D	Selec	4	A	Ther	W	Emp	10.66:1	50.63:1	S-El	36x4	36x4†	Ross	156	.....	.....	Gdy	80						
Pittsburger B.	5500	3200	Cont	4⅛x5¼	27.2	L	C	T	F	Strm	V	Bos	...	L	B-Li	4	U	Spic	W	Shel	8.75:1	35.8:1	S-El	36x5	36x7	Ross	160	Mon	Smi	.....	67.5						
Reliance B20.	5500	3200	Buda	4¼x5½	28.9	L	C	H	F	Strm	G	Eis	...	F	Cott	4	A	Peters	E	Badg	7.2:1	37.4:1	Shel	36x4	36x4†	Ross	156	Pier	Bim	Gdy	90						
Republic 19.	4150	2595	Cont	4⅛x5¼	27.2	L	C	C	B	Strm	G	Eis	...	D	Full	4	U	Spic	I	Torb	8:1	36.4:1	S-El	36x4	36x7	Jac	144	Phar	Pru	Fir	....						
Reynolds 2½	....	3550	.....	4¼x5½	28.9	L	C	Own	F	Strm	G	Mag	...	...	Own	4	A	.....	W	Own	7.75:1	36.81:1	S-El	36x4	36x8	Own	154	Hink	Smi	.....	80						
Rock Falls.	2800	....	Own 6	3½x5¼	29.4	L	P	H	B	Rayf	V	Bos	W	B	GLee	3	U	Spic	G	Flot	4.57:1	.....	Tut	35x5	35x5*	Gem	150	.....	Mut	Fir	60						
Rowe CDW.	4600	3575	Wis	4 x5	25.6	L	C	Fed	F	Zen	G	Bos	...	L	B-Li	4	U	Spic	W	Shel	7.74:1	11.75:1	Shel	34x4	36x4†	Ross	162	Simp	Hoo	.....	61						
Royal.	....	3500	Wis	4½x6	29.8	...	C	T	...	Strm	...	Bos	Q	B	Own	4	....	Own	W	Timk	.....	.....	Mer	36x4½	36x6	Ross	132	Mon	.....	.....	....						
Sandow J.	4500	3075	Cont	4⅛x5¼	27.2	L	P	T	B	Strm	G	Bos	...	B	B-Li	4	U	Spic	W	Timk	9.25:1	31:1	GC	36x4	36x7	Ross	165	Mon	Stn	.....	70						
Sanford W25.	5200	3290	Cont	4⅛x5½	27.2	L	P	T	F	Strm	G	Bos	...	B	B-Li	4	A	Spic	W	Shel	8.75:1	13.15:1	S-El	36x4	36x4†	Ross	174	Pier	Hoo	Fir	75						
Schacht.	6000	3650	Buda	4¼x5½	28.9	L	P	Own	F	Sheb	G	Bos	...	H	Own	3	A	Flex	W	Own	.....	.....	Nat	36x4	36x4†	Own	156	Dup	StM	.....	70						
Schwartz C.	4000	2950	Cont	4⅛x5¼	27.2	L	P	Fed	B	Strm	G	Bos	...	L	B-Li	3	U	Hart	I	Torb	10.2:1	40.8:1	Row	36x4	36x7	Ross	168	Pier	Sch	.....	.....						
Service 51.	5180	3475	Buda	4¼x5½	28.9	L	C	T	F	Strm	G	Eis	...	D	Selec	4	A	Spic	W	Timk	7.75:1	37.5:1	.....	36x4	36x7	Ross	160	Simp	Bim	.....	75						
Standard 76.	4430	3200	Cont	4⅛x5¼	27.2	L	P	Lng	S	Strm	G	Eis	...	D	B-Li	4	A	Spic	W	Timk	7.75:1	.....	S-El	36x4	36x7	Ross	140	Mon	.....	.....	70						
Sterling 2½	5500	3475	Ster	4⅝x5¾	30.6	L	C	Own	P	Rayf	V	Eis	...	L	B-Li	4	U	Spic	W	Timk	7.7:1	37.26:1	Math	36x4	36x4†	Ross	156	Wau	Wan	.....	88						
Stoughton E.	....	....	....	4½x5½	32.4	...	C	Own	C	Strm	G	Eis	...	D	B-Li	3	U	.....	W	Shel	8.75:1	.....	S-El	36x5	34x4†	.....	155	.....	Own	Gdy	....						
Tiffin MW.	4890	3200	Cont	4⅛x5¼	27.2	L	C	T	B	Sheb	G	Bos	...	F	Full	3	U	Acme	W	Shel	8.7:1	41.7:1	Kal	36x4	36x4†½†	Ross	148	Pier	Smi	Gdy	80						
Titan 2½	4950	3400	Buda	4¼x5½	28.9	L	P	T	F	Strm	G	Eis	...	D	Cott	4	U	M&E	I	Cl	8:1	42:1	Shel	34x4	36x4†	Wohl	156	Simp	Bim	.....	70..						
Tower H2½	4700	3300	Cont	4⅛x5¼	27.2	L	C	T	S	Strm	G	Bos	...	F	Full	3	U	Spic	W	Timk	9.25:1	33:1	Det	36x4	36x7	Ross	146	Pier	.....	Fir	70						
Triangle B.	4900	2850	Rut	4⅛x5½	27.2	L	C	Per	F	Strm	G	Eis	...	F	Full	4	U	UP	I	Cl	8:1	39:1	Det	36x4	36x7	Gem	151	Pier	Roy	Fir	60						
Union F.	4800	2675	Wis	4 x6	25.6	L	P	GO	F	Sheb	G	Eis	...	F	Full	4	U	UP	I	Russ	7.8:1	37.4:1	Math	36x4	36x7	Ross	152	Dup	Pru	.....	70						
United B.	....	2850	Buda	4¼x5½	28.9	L	C	T	F	Strm	V	Eis	Q	L	B-Li	4	....	Bld	I	Cl	.....	.....	.....	36x4	36x7	Ross	158	.....	.....	.....	80						
Ward LaFrance 2B	5400	3390	.....	4⅝x5¾	30.6	L	C	T	F	Zen	G	Bos	...	L	B-Li	4	A	Spic	W	Timk	6:1	24:1	.....	36x4	36x7	Lav	150	Simp	Bim	Fir	85						
White Hickory K.	4650	3075	Cont	4½x5¼	27.2	L	C	T	B	Strm	V	Eis	...	F	Full	4	U	M&E	W	Timk	8.5:1	40.8:1	Shel	36x4	36x7	Ross	144	Wau	Smi	Fir	80						
Wichita R.	5200	2950	Wau	3¾x5¼	22.5	L	P	Per	C	Strm	G	.....	...	C	B-Li	4	A	Ther	W	Timk	7.75:1	31:1	Per	36x4	36x3½	Own	135	Pier	.....	.....	75						
Wilcox C.	5000	....	Own	4½x5	32.4	L	P	T	S	Strm	G	Mag	...	C	Selec	4	A	Own	W	½-Fl	8.6:1	42.35:1	.....	34q4	36x7	Ross	152	Pier	.....	.....	80						
Wilson EA	4625	3150	Cont	4¼x5¼	27.2	L	C	T	B	Mar	G	Eis	...	B	B-Li	4	A	Ther	W	Timk	7.75:1	31:1	Per	36x4	36x6	Lav	159	.....	Own	.....	65						
Winther 459.	....	3200	Wis	4 x5	25.6	L	P	T	G	Mar	G	Eis	W	F	Full	3	U	Arv	W	Cl	9:1	36:1	Har	34x4													

3 Ton

Beck-Hawkeye D.	6000	3700	Cont	4½x5½	32.4	L	P	H	F	Strm	G	Bos	...	F	Full	3	U	Bld	I	Cl	9:1	2:1	Hig	36x5	36x8†	Lav	160	Pier	Smi	Fir	70						
Forschler B-X.	4725	3450	Cont	4⅛x5¼	27.2	L	C	Own	B	Zen	...	Bos	Q	F	Full	4	....	Hart	W	Shel	.....	.....	Own	36x4	36x8	Ross	137	Dup	Smi	.....	....						
F.W.D.-B.	6300	4500	Wis	4¾x5½	36.1	T	C	T	F	Strm	G	Eis	...	D	Cott	3	A	Q	B	Flot	8.9:1	35.6:1	Tut	36x6	36x6	Ross	124	Pier	Sch	Q	55						
Gersix L.	6100	4350	Buda	4½x6	32.4	L	C	Idl	F	Strm	V	Bos	...	B	Cott	4	A	Bld	W	Shel	10.25:1	53.3:1	Tut	36x5	40x10	Ross	170	Mon	Jon	.....	70						
Jumbo 30.	5000	3590	Buda	4¼x5½	28.9	L	P	Own	F	Zen	G	Eis	...	F	Full	4	U	Arv	I	Cl	9:1	4.84:1	Det	36x6*	42x9*	Jac	152	Dup	Cla	.....	75						
Kimball K.	5500	4400	Wis	4¾x5½	36.1	T	C	Flex	F	Zen	V	Ber	...	L	B-Li	4	A	Spic	W	Shel	7.75:1	37.31:1	US	36x4	36x8	Ross	Q	Dup	Smi	.....	80						
Packard 3E.	7000	4350	Own	4½x5½	32.4	L	C	T	F	Own	P	Dix	B	D	Selec	4	A	Spic	W	Flot	9:1	41.3:1	.....	36x5	36x5	Own	156	Own	.....	.....	52.1						
Rennoe M.	5050	2895	Buda	4½x5½	27.2	L	C	T	F	Strm	...	Spl	...	W	Warn	4	....	Hart	W	Wis	.....	.....	Row	36x5	36x7	Lav	144	Pier	.....	.....	65						
Riker B.	6900	4600	Own	4¼x6	28.9	T	C	T	B	B&B	G	Ber	W	C	Selec	4	A	Own	W	Own	10:1	42.5:1	.....	36x5	36x5†	Ross	150	Own	.....	.....	75						
Rowe GPW.	5500	4950	HSp 8	3¾x5	45	L	C	Fed	F	Zen	V	AtK.	W	L	B-Li	4	U	Spic	W	Shel	7.75:1	.....	Shel	38x7*	42x9*	Ross	170	.....	Hoo	.....	55						
Rowe GSW.	....	3900	Wis	4 x6	25.6	L	C	Fed	F	Zen	G	Bos	...	L	B-Li	4	U	Spic	W	Shel	7.75:1	11.75:1	Shel	36x5	36x5†	Ross	162	Simp	Hoo	.....	61						
U.S.R.	5200	5250	Own	4 x5¼	25.6	L	C	T	F	Strm	V	Eis	Q	D	B-Li	4	A	Q	W	Shel	7.75:1	41.5:1	Shel	36x4	36x4†	Lav	156	Own	Sch	.....	85						
Vim 23.	6370	3950	Her	4¼x5½	28.9	L	C	McC	F	Zen	G	Dix	...	L	B-Li	4	A	Spic	W	Shel	7.75:1	.....	Shel	36x5	36x5†	Gem	175	Dup	Smi	.....	....						
White 40.	7050	4300	Own	3¾x5¾	22.5	L	C	T	F	Own	V	Mag	...	D	Selec	4	U	Own	R	Own	.....	.....	.....	36x5	40x5†	Own	174	Own	.....	.....	70						
Wichita RX	5500	3400	Wau	4½x5¾	32.4	L	P	EM	C	Strm	G	.....	...	...	B-Li	4	A	Own	W	Shel	10.66:1	41.32:1	.....	36x4	36x8	Ross	144	Wau	Smi	Fir	....						
Winther 70.	6400	4100	Wis	4 x6	25.6	L	P	T	G	Mas	V	Eis	B	B	B-Li	4	A	Bld	I	Cl	9:1	36:1	Math	36x5	36x5†	Ross	150	.....	Cla	Fir	85						

3½ Ton

Acason L.	6400	4150	Wau	4¼x6¾	28.9	L	P	Can	S	Strm	V	Eis	...	B	Cott	3	U	Bld	W	Timk	10.33:1	49:1	Det	36x5	40x5†	Ross	172	Wau	Smi	.....	76						
Acme C.	6516	3875	Cont	4½x5½	32.4	L	C	GO	B	Rayf	V	Eis	...	B	Cott	4	A	Bld	W	Timk	10.33:1	54:1	Det	36x5	40x5†	Ross	168	Dup	Bim	.....	80						
Armleder KW.	6600	....	Cont	4½x5½	32.4	L	C	T	F	Zen	G	Bos	...	D	B-Li	3	U	Opt	W	Timk	8.75:1	35:1	Math	36x5	36x5†	Ross	186	.....	StM	.....	80						
Atterbury 7D-LWB.	6720	4275	Cont	4½x5½	32.4	L	C	T	S	Zen	G	Eis	...	L	B-Li	4	U	Spic	W	Timk	12:1	48:1	SP	36x5	40x5†	Gem	192	Mon	Arc	Fir	92						
Atterbury 7D Standard.	7040	4175	Cont	4½x5½	32.4	L	C	T	S	Zen	G	Eis	...	L	B-Li	4	U	Spic	W	Timk	10.33:1	41.3:1	SP	36x5	40x5†	Gem	167	Mon	Arc	Fir	98						
Autocar Heavy Duty Y.	6700	4100	Own	4¼x5½	28.9	L	C	V	S	.....	...	.....	...	D	Selec	4	....	.....	R	Own	8.7:1	.....	.....	34x5	36x10	.....	...	.....	.....	.....	...						
Available H3.	6550	4200	Cont	4½x5½	32.4	L	C	T	B	Strm	V	Bos	...	L	B-Li	4	A	Spic	W	Wis	10.33:1	41.33:1	Tut	36x5	40x5†	Ross	176	Pier	Sch	.....	90						
Bethlehem F.	4983	3465	Own	4⅜x6	30.6	L	P	Fed	B	Sheb	G	Will	G	B	Det	3	U	Spic	I	Russ	9.4:1	30.08:1	Shel	34x4	34x5†	Lav	162	Pier	Wan	Fir	85						
Brockway R2.	6800	4100	Cont	4½x5½	32.4	L	C	Bus	B	Strm	G	Eis	...	L	B-Li	4	A	Spic	W	Timk	10.33:1	41.4:1	Mer	36x5	36x5†	Gem	164	Q	Smi	.....	70						
Chicago C3½.	6900	4300	Her	4½x5½	32.4	L	..	T	F	Strm	G	Bos	G	L	B-Li	4	A	Peters	W	Timk	10.33:1	50:1	Math	36x5	36x10	Gem	168	Simp	Q	Stn	....						
Clydesdale 90.	6600	4075	Cont	4½x5½	32.4	L	C	T	S	Zen	G	Bos	...	L	B-Li	4	A	Spic	W	Timk	10.33:1	50:1	Stan	36x5	40x10	Ross	170	Own	Smi	.....	78						
Corbitt A.	6780	4200	Cont	4½x5½	32.4	L	C	McC	B	Strm	V	Eis	...	D	B-Li	4	U	Hart	W	Shel	11.75:1	47:1	Shel	36x5	36x10	Ross	178	Pier	Smi	.....	75						
Couple Gear HC.	9000	6100	Wis	5.1x5½	41.9	T	G	H	F	Strm	G	Eis	...	...	Own	5	....	Own	B	Own	25:1	.....	Tut	36x4†	36x4†	Own	144	.....	Own	Own	55						
Dart W	6740	4000	Buda	4½x6	32.4	L	C	C	F	Zen	G	Eis	...	F	Full	4	A	Spic	W	Own	9.6:1	53.6:1	Per	36x5	36x10	Ross	160	Pier	Pru	.....	75						
Day-Elder F.	5750	3550	Cont	4½x5½	32.4	L	P	Bus	B	Zen	G	Eis	...	D	B-Li	4	U	Hart	W	Wis	11.75:1	47:1	Shel	36x5	36x5†	Ross	165	Mon	Jon	Stn	73						
Denby 27.	6890	4250	Cont	4½x5½	32.4	L	C	Lng	B	Strm	G	Eis	...	D	Warn	4	A	Peters	I	Cl	10:1	49.9:1	Det	36x5	36x10	Ross	170	Simp	Smi	.....	78						
Diamond T-LB.	6425	4390	.....	4½x5½	32.4	L	C	T	B	Strm	G	Bos	...	L	.....	4	A	Spic	W	.....	8.75:1	42.35:1	Math	36x5	36x5†	.....	170	Pier	.....	.....	....						
Dorris K7.	6750	4200	Own	4¼x5½	28.9	I	C	T	F	Strm	G	Bos	...	D	Warn	4	A	Spic	W	Timk	10.33:1	51.5:1	Row	36x5	36x10	Ross	194	Own	Smi	.....	70						
Duplex E.	6050	4250	Buda	4¼x5½	28.9	I	C	L	B	Sheb	V	Eis	...	L	B-Li	4	U	Peters	I	Own	8:1	32:1	Tut	36x8	36x8	Wohl	130	Dup	Pru	.....	60						
Erie 3½.	7200	....	Buda	4¼x5½	28.9	L	C	McC	B	Strm	G	Bos	...	D	Full	4	A	Spic	W	Shel	.....	.....	Per	36x5	40x5†	Ross	168	Pier	Hoo	.....	80						
Fageol 4500.	7300	....	Wau.	4½x6½	32.4	L	C	Spi	F	Zen	V	Dix	...	B	Selec	5	A	Spic	W	Timk	6.3:1	67:1	Math	36x5	36x5†	Ross	172	Wau	Pru	.....	80						
Federal WD.	7000	3850	Cont	4½x5½	32.4	L	C	T	B	Zen	G	Eis	...	B	Own	4	A	Spic	W	Timk	10.33:1	51.54:1	Math	36x5	36x5†	Gem	156	Phar	Smi	Fir	74.5						
Garford 77D	7550	4190	Buda	4½x6	32.4	L	C	T	F	Strm	G	Spl	...	L	Selec	4	A	Spic	W	Timk	10.33:1	41.32:1	S-El	36x5	40x5†	Ross	162	Simp	Smi	.....	....						
Gary KT.	7000	3950	Buda	4½x6	32.4	L	C	T	F	Mas	G	Eis	...	L	B-Li	4	A	Spic	W	Timk	10.33:1	41.32:1	S-El	36x5	40x5†	Ross	162	McC	Pru	.....	....						

Model	Chassis Weight	Chassis Price	Engine—4 Cyl. unless otherwise noted	Bore and Stroke	Horsepower	Valve Arrange't	How Cooled	Radiator Make or Type	Lubrication	Carburetor	Fuel Feed	Ignition System	Engine Starter	Clutch	Transmission	Speeds Forward	Location of Transmission	Universal	Final Drive	Rear Axle	Total Gear Reduction in High	Total Gear Reduction in Low	Springs	Front Tires	Rear Tires	Steering Gear	Wheelbase	Governor	Wheels—Make	Rim Equipment	Pr. Cent of Weight on Rear Wheels
3½ Ton—Continued																															
Giant 17	6800	3850	Cont	4½x5½	32.4	L	P	Own	B	Strm	G	Eis	...	L	B-Li	4	A	Spic	W	Shel	10.25:1	49.61:1	Shel	36x5	36x5†	Ross	176	Pier	Wan	.....	70
G.M.C. 71A	7540	....	Cont	4½x5½	32.4	L	C	McC	P	Mar	G	Eis	...	D	Selec	4	A	Own	W	Timk	12:1	58.6:1	Det	36x5†	40x5†	Jac	163	Mon	Own	SAE	75
G.M.C. 71B	7655	....	Cont	4½x5½	32.4	L	C	McC	P	Mar	G	Eis	...	D	Selec	4	A	Own	W	Timk	12:1	58.6:1	Det	36x5	40x5†	Jac	187	Mon	Own	SAE	75
Gramm-Bernstein 35	8640	4450	Hink	4½x5½	32.4	L	C	T	F	Strm	V	Eis	...	D	Own	4	A	Own	W	Stan	8.75:1	50.6:1	.....	36x5	40x5†	Ross	156	.....	.....	Fir	....
Hahn F	6600	....	.....	4½	32.4	L	C	Own	F	Strm	...	Bos	...	D	B-Li	4	....	Spic	W	Timk	.....	.....	.....	36x5	36x5†	Ross	Q	Pier	.....	.....	....
Hall	6100	3750	Cont	4½x5½	32.4	L	P	L	B	Zen	G	Bos	...	L	B-Li	..	A	K-B	W	Timk	10.33:1	.....	Det	36x5	36x5†	Gem	Q	Dup	Smi	.....	....
Harvey WHA	7700	4300	Buda	4½x6	32.4	L	P	T	B	Zen	G	Eis	...	B	B-Li	4	A	Spic	W	Shel	8.75:1	42.35:1	Shel	36x5	36x5†	Ross	160	Mon	Smi	.....	80
Hendrickson J	....	4000	Buda	4¼x5½	28.9	L	C	T	F	Strm	G	Dix	...	D	Full	4	A	Ther	W	Timk	10.33:1	49.6:1	Tut	36x5	36x5†	Ross	Q	McC	Stn	.....	80
Hewitt-Ludlow	6300	4000	Buda	4½x5½	28.9	...	...	.....	...	Strm	...	Bos	...	B	Cott	4	....	Spic	W	Wis	.....	.....	.....	36x5	36x5†	Ross	156	.....	.....	.....	....
Hurlburt	6400	4400	Buda	4½x6	32.4	L	C	T	B	Flch	G	Eis	...	D	B-Li	4	A	Spic	W	Flot	8.66:1	41.91:1	.....	36x5	36x5	Ross	156	Dup	Wan	.....	....
Indiana 35	7000	3900	Own	4⅜x5½	30.6	L	C	T	F	Strm	G	Eis	...	B	Selec	4	A	Spic	W	½-Fl	10.25:1	49.6:1	S-El	36x5	36x5†	Wohl	160	Pier	Smi	.....	75
International L	7500	4500	Own	4¼x5	28.9	I	T	Own	B	Ens	G	Dix	O	D	Own	4	A	Own	I	Own	11:1	53.25:1	.....	36x5	40x10	Own	160	Own	Own	Fir	50
Jumbo 35	6400	4300	Buda	4½x6	32.4	L	P	Own	F	Zen	G	Eis	Q	L	B-Li	4	U	Spic	I	Cl	9:1	5.35:1	Per	36x5	36x10	Jac	165	Simp	Day	.....	75
Kalamazoo K	7370	3900	Cont 6	3¼x5¼	33.8	L	P	Hvn	B	Strm	V	Bos	D	B	Full	4	A	Acme	W	Shel	10:1	.....	Shel	36x5	36x5†	Ross	160	Pier	Bim	.....	....
Kelly-Springfield K40	8285	4400	Own	4½x6½	32.4	T	C	Fed	F	Rayf	G	Eis	W	C	Covt	3	A	Own	C	Dead	10.48:1	31.6:1	Per	36x5	40x5†	Gem	150	Pier	StM	.....	93
Kissel Heavy Duty	6840	4175	Own	4¼x5½	28.9	L	C	McC	S	Strm	V	Eis	...	W	Warn	4	A	Spic	W	Shel	11.75:1	58.6:1	Shel	36x5	36x5†	Ross	168	Pier	Smi	.....	74
Kleiber C	....	4400	Cont	4½x5½	32.4	...	...	.....	...	Strm	G	Bos	...	...	B-Li	..	A	.....	W	.....	8.75:1	35:1	.....	36x5	36x10	Ross	163	.....	W&L	.....	....
Larrabee-Deyo L	6850	4000	Cont	4½x5½	32.4	L	C	Bus	S	Sheb	G	Bos	...	L	B-Li	4	A	Q	W	Shel	10.25:1	41:1	Mer	36x5	36x5†	Ross	186	Simp	Hoo	.....	....
Maccar M	6175	4300	Cont	4½x5½	32.4	L	C	Own	B	Strm	G	Bos	...	L	B-Li	3	U	Spic	W	Timk	8.75:1	35.09:1	Mer	36x5	36x5†	Ross	174	Pier	Day	Fir	70
Mack AC	8070	4950	Own	5 x6	40	L	C	Own	S	Zen	G	Aer	...	O	Own	3	UJ	Spic	C	OwnD	7.55	24:2	Mer	36x5	40x5†	Gem	Q	Own	Sch	.....	65
Master A	7000	4190	Buda	4½x6	32.4	L	C	T	B	Mas	G	Eis	...	D	B-Li	4	A	Spic	W	Timk	10.33:1	41.32:1	Det	36x5†	40x5	Ross	158	Pier	Smi	.....	72
Master AL	7200	4290	Buda	4½x6	32.4	L	C	T	B	Mas	G	Eis	...	D	B-Li	4	A	Spic	W	Timk	10.33:1	41.32:1	Det	36x5†	40x5	Ross	194	Pier	Smi	.....	72
Menominee G	....	4270	Cont	4½x5½	32.4	L	C	T	B	Strm	G	Eis	...	F	Full	4	A	Spic	W	Timk	10.33:1	41.32:1	Tut	36x5	36x6†	Ross	160	Pier	Stn	Fir	80
Nelson & LeMoon F3½	6000	7280	Cont	4¼x6½	28.9	T	C	T	S	Strm	G	Bos	...	L	B-Li	4	U	Own	W	Timk	8.75:1	42:1	Tut	36x5	36x5†	Lav	Q	Mon	Pru	Gdy	80
Noble E70	6500	....	Buda	4½x6	32.4	L	C	T	...	Strm	G	Eis	...	F	Full	4	A	.....	W	Shel	8.75:1	.....	S-El	36x5	36x10	Lav	196	Pier	Bim	Fir	85
Northway B3	7260	4250	Own	4 x6	25.6	I	C	GO	P	Sheb	V	Bat	W	F	Full	4	U	Spic	W	Shel	10.25:1	49.2:1	Per	36x5	40x5†	Ross	160	Pier	Cla	... ..	72
O.K. 3½T	....	3850	Buda	4¼x6	32.4	...	P	Own	B	Zen	V	Eis	...	F	Full	4	U	.....	W	Wis	.....	.....	Tut	36x5	36x10	Ross	164	Pier	.....	.....	....
Old Reliable C	6650	4250	Wis	4¼x6	28.9	L	C	T	B	Strm	V	Bos	...	D	Full	4	A	Spic	W	Shel	8.75:1	42.5:1	Shel	34x5	36x5†	Ross	160	Mon	StM	.....	75
Oneida D9	6830	4100	Own	4½x5½	32.4	L	C	Own	...	Strm	...	Mag	...	D	Own	4	A	Own	W	Own	10.25:1	48:1	S-El	36x5	36x10	W	170	Own	.....	.....	....
Paige 51-18	7000	4150	Cont	4½x5½	32.4	L	C	T	B	Strm	G	Bos	...	D	Selec	4	A	Spic	W	Timk	10.33:1	49.7:1	Per	36x5	36x5†	Ross	160	Simp	Day	.....	80
Parker J20	6200	4400	Wis	4½x6	32.4	L	C	Own	F	Strm	G	Bos	W	L	Warn	4	A	Bld	W	Own	7.8:1	38.92:1	S-El	38x7*	44x10	Ross	160	Mon	Bim	.....	76
Pioneer A	....	3290	Cont	4½x5½	32.4	...	C	.....	...	Strm	V	Eis	...	...	B-Li	4	A	.....	W	Timk	.....	.....	.....	36x5	36x5†	.....	160	.....	.....	.....	....
Republic 20	6250	3795	Cont	4½x5½	32.4	L	C	T	B	Strm	G	Eis	...	D	Full	4	U	Hart	I	Torb	10:1	48:1	S-El	36x5	36x10	Jac	165	Phar	Smi	Fir	....
Reynolds 3½	....	4450	.....	4½x5½	32.4	I	C	Own	F	Strm	G	Mag	...	...	Own	4	A	.....	W	Own	8.75:1	44.36:1	S-El	36x5	36x5†	Own	176	Hink	Smi	.....	80
Sandow M	6500	4095	Cont	4½x5½	32.4	L	P	T	B	Strm	G	Bos	...	D	B-Li	4	A	Spic	W	Timk	10.33:1	42:1	GC	36x5	36x5†	Ross	175	Mon	Pru	.....	70
Sanford W35	6600	4050	Cont	4½x5½	32.4	L	P	T	F	Strm	G	Bos	...	B	B-Li	4	A	Spic	W	Shel	8.75:1	13.15:1	S-El	36x5	36x5†	Ross	174	Pier	Hoo	Fir	75
Schacht	6500	4150	Buda	4¼x6	28.9	L	P	Own	F	Sheb	G	Bos	...	H	Own	4	A	Flex	W	Own	.....	.....	Nat	36x5	36x5†	Own	168	Dup	StM	.....	70
Schwartz D	7000	4500	Buda	4½x6	32.4	L	P	Fed	B	Strm	...	Bos	...	L	B-Li	4	....	M&E	I	Torb	.....	.....	Row	36x6	36x10	Ross	170	Dup	Sch	.....	....
Selden 3½A	7100	3990	Cont	4½x5½	32.4	L	C	T	F	Strm	G	Eis	...	L	B-Li	4	A	Spic	W	Timk	8.25:1	42:1	Per	36x5	36x10	Gem	162	Pier	Arc	.....	70
Service 71	6930	4285	Buda	4¼x5½	28.9	L	C	T	F	Strm	G	Eis	...	D	Selec	4	A	Spic	W	Timk	8.75:1	42.3:1	.....	36x5	36x5†	Ross	171	Simp	Bim	.....	70
Service 76	7280	4485	Buda	4½x6	32.4	L	C	T	F	Strm	G	Eis	...	D	Selec	4	A	Spic	W	Timk	7.8:1	37.7:1	.....	36x5	36x5†	Ross	171	Simp	Bim	.....	70
Signal M	7070	4200	Cont	4½x5½	32.4	L	C	McC	B	Strm	G	Eis	...	B	B-Li	4	A	Spic	W	Timk	12:1	58:1	Det	36x5	40x5†	Ross	168	Pier	Hay	Gdy	80
Standard 66	6480	4200	Cont	4½x5½	32.4	L	P	Lng	S	Strm	V	Eis	...	D	B-Li	4	A	Spic	W	Timk	10.33:1	.....	S-El	36x5	36x5†	Gem	160	Mon	.....	.....	75
Sterling 3½	8300	4550	Ster	4¼x6¼	32.4	L	C	Own	P	Rayf	V	Eis	...	M	Own	3	A	Spic	W	Timk	8.75:1	39.5:1	Math	36x5	40x5†	Ross	162	Wau	.....	.....	92
Stewart 10	6080	3895	Cont	4½x5½	32.4	L	P	T	B	Zen	G	Eis	...	F	Full	4	U	Hart	I	Cl	10:1	48:1	Det	36x5	36x5†	Ross	165	Pier	Cla	Fir	80
Tiffin PW	6850	4175	Cont	4½x5½	32.4	L	C	T	S	Sheb	G	Bos	...	F	Full	4	A	Acme	W	Shel	8.7:1	41.7:1	Kal	36x5	36x5†	Ross	160	Pier	Smi	Gdy	80
Titan 3½	7300	4400	Buda	4½x6	32.4	L	C	T	F	Strm	G	Eis	...	D	Cott	4	A	UP	I	Cl	9:1	48:1	Math	36x5	40x5†	Lav	162	Simp	Day	.....	70
Tower G3½	6800	4200	Cont	4½x5½	32.4	L	C	T	S	Strm	G	Bos	...	F	Full	4	U	Spic	W	Timk	10.33:1	50:1	Det	36x5	36x5†	Ross	165	Pier	.....	.....	70
Twin City 4 Wheel D-B	7200	4750	Wis	5½x6	42	T	C	H	B	Strm	G	K-W	...	M	Cott	3	A	.....	I	½-Fl	.....	.....	.....	36x6	36x6	Ross	140	Pier	Arc	SAE	60
United C	....	3750	Buda	4½x5½	28.9	L	C	.....	F	Strm	G	Eis	Q	L	B-Li	4	A	Bld	I	Cl	10:1	.....	.....	36x5	36x5†	Ross	160	Simp	Cla	Fir	80
Victor M	6600	3800	Cont	4½x5½	32.4	L	C	Own	B	Strm	...	Bos	...	L	B-Li	4	....	Spic	W	Timk	.....	.....	S-El	36x6	36x5†	Gem	176	.....	.....	.....	....
Ward LaFrance 4A	....	4290	.....	4½x6¼	32.4	L	C	T	F	Zen	G	Bos	...	L	B-Li	4	A	Spic	W	Timk	6.28:1	30.38:1	.....	36x5	36x5†	Ross	161	.....	Smi	.....	85
White Hickory M	....	....	Cont	4½x5½	32.4	L	C	T	B	Strm	...	Eis	...	D	Full	4	....	.....	W	Timk	.....	.....	Shel	36x5	36x10	W	156	Simp	.....	.....	....
Wichita O	6500	3750	Beav	4¼x6	28.9	I	P	EM	C	Strm	G	.....	...	C	B-Li	4	A	Own	W	Shel	11.33:1	47:1	.....	36x5	36x5†	Ross	165	Dup	Smi	.....	80
Wilcox E	6600	....	Buda	4½x6	32.4	L	P	T	S	Strm	G	Mag	...	C	Selec	4	A	Own	W	½-Fl	10.25:1	45.1:1	Shel	36x5	36x5†	Own	147	Pier	.....	.....	75
Wilson G	6800	3950	Cont	4½x5½	32.4	L	C	T	B	Mar	G	Eis	...	B	B-Li	4	A	K-B	W	Timk	8.75:1	42.35:1	Per	36x5	36x5†	Ross	160	Pier	.....	.....	80
Winther 479	7700	4900	Wis	4¼x6	28.9	L	P	T	G	Mas	V	Eis	B	B	Full	4	A	Bld	I	Cl	10:1	48:1	Math	36x5	36x5†	Ross	158	.....	Own	Fir	65
Winther 979	....	4250	Wis	4½x6	32.4	L	P	T	G	Mas	V	Eis	B	B	B-Li	4	A	Bld	I	Cl	7:1	33.88:1	Math	38x7*	42x9*	Ross	168	.....	Cla...	.....	80
4 Ton																															
Bessemer K2	6740	3985	Cont	4½x5½	32.4	L	C	C	B	Rayf	...	Bos	...	B	B-Li	4	....	Spic	I	Torb	.....	.....	Per	36x5	36x10†	Ross	175	Pier	.....	.....	75
Gabriel F	5800	4300	Buda	4½x6	32.4	L	T	T	F	Rayf	G	Bos	L	B	B-Li	4	A	Spic	W	Timk	10.5:1	1:1	Mer	36x5	40x10	Gem	180	Dup	Smi	Fir	65
Highway-Knight	7400	4800	.....	4 x6	25.6	S	T	Own	F	Zen	V	Mag	R	O	Own	4	A	Ther	W	.....	8.75:1	42.35:1	.....	36x5	36x5†	.....	159	.....	Sch	.....	90
Jumbo 40	6800	4875	Buda	4½x6	32.4	L	P	Own	F	Zen	G	Eis	Q	L	B-Li	4	U	Spic	I	Cl	10:1	5.35:1	Per	48x7*	44x10	Jac	165	Simp	Cla	.....	75
Kelly-Springfield K45	8730	4550	Own	4½x6½	32.4	T	C	Fed	F	Rayf	G	Eis	W	L	Covt	3	A	Own	C	Dead	10.71:1	32.3:1	Per	36x5	40x6†	Gem	150	Pier	StM	.....	93
Kimball E	8100	5000	Wis	5.1x5½	41.9	T	C	Flex	F	Zen	V	Ber	...	L	B-Li	4	A	Spic	W	Shel	8.75:1	42.35:1	US	36x5	40x10	Ross	Q	Dup	Smi	.....	80
King Zeitler	6500	4200	Cont	4½x5½	32.4	L	G	T	B	Strm	...	Bos	...	L	B-Li	4	....	Ther	W	Timk	.....	.....	Mer	36x5	40x5†	Lav	180	Pier	.....	.....	80
Moreland 20G	7810	4875	Cont	4¾x6	36.1	L	C	Own	F	Mill	G	Dix	...	D	Selec	4	A	Ther	W	Timk	7.75:1	37.71:1	US	36x5	40x5†	Ross	162	Cont	Smi	SAE	....
Packard 4E	7460	4550	Own	4½x5½	32.4	L	C	T	F	Own	P	Dix	B	D	Selec	4	A	Spic	W	Flot	10:1	46:1	.....	36x5	40x5	Own	156	Own	.....	.....	55
Riker BB	7200	4700	Own	4¼x6	28.9	T	C	T	B	B&B	G	Ber	W	C	Selec	4	A	Own	W	Own	10:1	42.5:1	.....	36x5	36x6†	Ross	150	Own	.....	.....	77
Rowe HW	6520	4350	Wis	4¼x6	28.9	L	C	Fed	F	Zen	G	Bos	...	L	B-Li	4	U	Spic	W	Shel	8.75:1	12.75:1	Shel	36x5	36x6†	Ross	156	Simp	Hoo	.....	54

| | | |

5½, 6 and 7 Ton—Continued

Model	Chassis Weight	Chassis Price	Engine—4 Cyl. unless otherwise noted	Bore and Stroke	Horsepower	Valve Arrange't	How Cooled	Radiator Make or Type	Lubrication	Carburetor	Fuel Feed	Ignition System	Engine Starter	Clutch	Transmission	Speeds Forward	Location of Transmission	Universal	Final Drive	Rear Axle	Total Gear Reduction in High	Total Gear Reduction in Low	Springs	Front Tires	Rear Tires	Steering Gear	Wheelbase	Governor	Wheels—Make	Rim Equipment	Pr. Cent of Weight on Rear Wheels
Winther 149	9600	5500	Wis	5 x6	40	T	C	T	G	Mas	V	Eis	B	B	B-Li	4	A	Bld	I	Cl	12.5:1	60.5:1	Math	36x6	40x7	Ross	162	Dup	Cla	.....	80
Couple Gear LD-6	12000	7350	Wis	5¼x7	44.1	T	G	H	F	Strm	G	Eis	O	...	Own	5	.....	Own	B	Own	12:1	.....	Tut	36x5†	36x6	Own	144	.....	Own	Own	65
Mack AC	9050	6000	Own	5 x6	40	L	C	Own	S	Zen	G	Aer	...	O	Own	3	UJ	Spic	C	Own D	11.58	37.16	Mer	36x7	40x7†	Gem	Q	Own	Sch	.....	73
Old Reliable K,L,M	10240	6250	Wau	4¾x6¾	36.1	L	C	T	B	Strm	G	Bos	...	W	D-Sea	4	A	Spic	C	Shel	10.86:1	54.9:1	Shel	36x6	40x7†	Ross	136	Wau	Smi	.....	78
Royal 7	.....	.....	Wis	5¼x7	44.1	...	C	T	...	Strm	...	Bos	Q	...	Own	...	A	.....	W	Timk	.....	.....	Mer	36x7	40x7†	Ross	168	Mon	.....	.....	....
Sterling 7½-Chain	11000	6000	Ster	5x6¼	40	L	C	Own	...	Rayf	V	Eis	...	M	Own	6	UJ	UM	C	Own	7.26:1	43.6:1	Math	36x6	40x7†	Ross	174	Wau	Smi	.....	91
Wichita S	9200	5400	Beav	4½x6	32.4	I	P	EM	C	Strm	G	Ber	...	C	Own	4	A	Own	...	Own	13:1	66.2:1	.....	36x6	40x6†	Ross	165	Dup	Smi	.....	90

Gasoline Tractor-Trucks

Model	Chassis Weight	Chassis Price	Engine—4 Cyl. unless otherwise noted	Bore and Stroke	Horsepower	Valve Arrange't	How Cooled	Radiator Make or Type	Lubrication	Carburetor	Fuel Feed	Ignition System	Engine Starter	Clutch	Transmission	Speeds Forward	Location of Transmission	Universal	Final Drive	Rear Axle	Total Gear Reduction in High	Total Gear Reduction in Low	Springs	Front Tires	Rear Tires	Steering Gear	Wheelbase	Governor	Wheels—Make	Rim Equipment	Pr. Cent of Weight on Rear Wheels
Columbia T	4000	2750	Hink	4 x5¼	25.6	L	C	T	B	Shk	...	Dix	...	C	Covt	3	U	Spic	I	Russ	.....	.....	Per	36x4	36x7	Own	112	Pier	.....	.....	....
Federal Light Duty	4700	3050	Cont	4⅛x5¼	27.2	L	C	T	B	Zen	G	Eis	...	B	Own	4	A	Spic	W	Timk	9.25:1	40.7:1	Math	36x4	36x7	Gem	110	Phar	.....	Fir	....
Federal Heavy Duty	6800	4025	Cont	4½x5½	32.4	L	C	T	B	Zen	G	Eis	...	B	Own	4	A	Spic	W	Timk	12:1	59.88:1	Math	36x5	36x5†	Gem	114	Phar	.....	Fir	....
Garford 70HT	4750	3290	Buda	4¼x5½	28.9	L	C	T	F	Strm	G	Spl	...	L	Selec	4	....	Spic	W	Timk	.....	.....	Per	36x4	36x7	Ross	119	Simp	.....	.....	....
Garford 77CT	7200	4400	Wis	4¾x5½	36.1	T	C	T	F	Rayf	G	Eis	...	L	Selec	4	....	Spic	W	Timk	.....	.....	Per	36x5	40x5†	Ross	105	Simp	Smi	.....	....
Garford 68T	8450	5100	Wis	5.1x5½	41.6	T	C	T	F	Rayf	G	Eis	...	L	Selec	4	....	Spic	C	Dead	.....	.....	Per	36x6	40x6†	Ross	102	Simp	Smi	.....	....
Hewitt-Ludlow 6-Ton	4000	3300	Buda	4¼x5½	28.9	...	..	T	F	Strm	...	Bos	...	B	.....	..	....	Spic	C	.....	.....	.....	.....	36x5	36x4†	Lav	...	.....	.....	.....	....
Hood	2900	1425	Own	3¾x3¾	22.5	T	C	Idl	S	Holl	G	Mag	...	D	Plan	2	U	Own	C	Own	8:1	24:1	Lah	20x3½	20x5	Own	60	.....	Own	.....	65
Jumbo D	4450	2700	Buda	4¼x5½	28.9	L	C	GO	F	Zen	G	Eis	Q	F	Full	3	U	Arv	I	Cl	9:1	4.84:1	Det	36x4	36x7	Jac	152	Dup	Day	.....	60
Knox 35	8500	6000	Own	5 x5½	40		I	C	Fed	F	Zen	V	Mag	G	D	Selec	3	A	.....	W	Timk	1:.08	1:.0145	.....	36x4	38x6†	Ross	108	.....	Wan	.....	60
Knox 36 3-Ton	10000	6500	Own	5 x5½	40		I	C	Fed	F	Zen	V	Mag	G	D	Selec	3	A	.....	W	Timk	1:.08	1:.0145	.....	36x4	38x6†	Ross	108	.....	Wan	.....	....
Koehler MT	4750	3450	Her	4 x5⅛	25.6	L	C	T	P	Zen	...	Eis	...	D	B-Li	4	A	Spic	W	Timk	9.25:1	37:1	Math	36x4	36x7	Lav	142	Simp	Wan	SAE	....
Kuhn	9000	5000	Wis	4¼x5½	28.9	T	C	H	S	Rayf	...	Bos	...	C	Selec	4	....	.....	B	Own	.....	.....	.....	36x7	36x7	.....	138	.....	.....	.....	....
Lombard	8000	....	Spec 6	5½x6¾	72.7	...	C	Spec	F	Sheb	P	.....	...	D	Spec	..	A	.....	...	W	.....	.....	.....	.....	.....	Spec	...	.....	.....	.....	90
Mack AB 5-Ton	4940	3400	Own	4 x5	25.6	L	C	Own	S	Zen	G	Aer	...	L	B-Li	4	U	Bld	C	Own	10.53	42.27	Mer	36x4	36x4†	Gem	120	Own	Sch	.....	....
Mack AC 7-Ton	7670	4950	Own	5 x6	40		L	C	Own	S	Zen	G	Aer	...	O	Own	3	UJ	Spic	C	Own D	10.76	34.60	Mer	36x5	40x5†	Gem	119	Own	Sch	.....	....
Mack AC 10-Ton	8250	5500	Own	5 x6	40		L	C	Own	S	Zen	G	Aer	...	O	Own	3	UJ	Spic	C	Own D	11.58	37.16	Mer	36x6	40x6†	Gem	119	Own	Sch	.....	....
Mack AC 13-Ton	8272	5750	Own	5 x6	40		L	C	Own	S	.....	G	Aer	...	O	Own	3	UJ	Spic	C	Own D	12.92	41.5	Mer	36x6	40x12	Gem	119	Own	Sch	.....	....
Mack AC 15-Ton	8650	6000	Own	5 x6	40		L	C	Own	S	Zen	G	Aer	...	O	Own	3	UJ	Spic	C	Own D	14.10	45.26	Mer	36x7	40x7†	Gem	119	Own	Sch	.....	....
Rennoc 8-Ton	5050	2850	Buda	4⅛x5½	27.2	L	C	T	F	Strm	...	Spl	...	D	Warn	4	....	Hart	W	Wis	.....	.....	Row	36x5	36x7	Lav	116	Pier	.....	.....	60
Watson	6500	4050	Cont	4½x5½	32.4	L	C	Jam	B	Strm	...	Bos	...	L	B-Li	4	....	Spic	W	Timk	.....	.....	Shel	34x4	36x5	Gem	80	Pier	.....	.....	37

Electric Commercial Cars

E. C. M. Name and Model Number	Carrying Capacity	Chassis Weight	Chassis Price	Maximum Speed	Battery	Mileage Per Charge	Motor	Controller	Speeds Forward	Drive	Rear Axle	Springs	Front Tires	Rear Tires	Steering Gear	Wheelbase	Pr. Cent of Weight on Rear Wheels
Ward WS	750	1400	.....	12	Edis	45	G-E	Own	4	W	Shel	Shel	32x2½	32x3	Own	88	60
C-T ½	1000	1800	1900	14	Opt	60	G-E	Own	4	C-T	Flot	Shel	36x3	36x3	W	89¼	60
Walker M	1000	2300	.....	15	Opt	60	West	West	5	O	Own	Math	34x3	36x3½	Ross	93	66
Atlantic 1C	2000	2770	.....	12	Opt	.....	G-E	G-E	4	C	Timk	S-El	34x4	36x4	Ross	103	65
Ward WA	1250	2730	.....	12	Edis	47	G-E	G-E	4	W	Shel	Shel	32x3	34x3½	Own	90	60
C-T 1	2000	2500	2300	14	Opt	60	G-E	Own	4	C-T	Flot	Shel	36x3½	36x4	W	101	60
Walker K	2000	2700	.....	14	Opt	60	West	West	5	O	Own	Math	34x3½	36x4	Ross	96	66
Ward WB	2000	3430	.....	10	Edis	43	G-E	G-E	4	W	Shel	Shel	34x3½	36x4	Own	102	60
Atlantic 2C	4000	3590	.....	11	Opt	.....	G-E	G-E	4	C	Timk	S-El	34x4	36x3†	Ross	115	65
C-T 2	4000	3500	2700	12	Opt	60	G-E	Own	4	C-T	Flot	Shel	36x4	36x4†	W	116	60
Walker L	4000	3800	.....	13	Opt	60	West	West	5	O	Own	Math	38x4	38x6	Ross	112	66
Ward WD	4000	4500	.....	8.5	Edis	35	G-E	G-E	4	W	Shel	Shel	36x4	36x7	Own	114	60
Atlantic 3C	7000	5220	.....	10	Opt	.....	G-E	G-E	5	C	Timk	.....	36x5	40x5†	Ross	135	65
C-T 3½	7000	5000	3900	11	Opt	50	G-E	Own	4	I	Dead	Shel	36x6†	36x4†	W	122	55
Ward WF	7000	6600	.....	7	Edis	30	G-E	G-E	4	W	Shel	Shel	36x5	36x8	Own	132	60
Atlantic 5C	10000	6230	.....	9	Opt	.....	G-E	G-E	5	C	Timk	S-El	36x6	40x5†	Ross	144	65
Couple Gear H	7000	9000	4800	10	Phil	30	Own	Own	5	B	Own	Tut	36x5†	36x5†	Own	96	55
Couple Gear	10000	10000	5250	7	Phil	30	Own	Own	5	B	Own	Tut	36x5†	36x5†	Own	96	75
C-T 5	10000	6000	4400	9	Opt	50	G-E	Own	4	I	Dead	Shel	36x7	36x5†	W	132	55
Walker P	7000	5600	.....	11	Opt	50	West	West	5	O	Own	Math	36x5	38x5†	Ross	131	66
Walker N	10000	6400	.....	10	Opt	50	West	West	5	O	Own	Math	36x6	38x6†	Ross	141	66
Ward WH	10000	8375	.....	6	Edis	26	G-E	G-E	4	W	Shel	Shel	36x7	40x10	Own	144	60
Atlantic 6C	13000	6940	.....	8	Opt	.....	G-E	G-E	5	C	Timk	S-El	36x6	40x6	Ross	156	65
Couple Gear	14000	11000	5900	10	Phil	30	Own	Own	5	B	Own	Tut	36x5†	36x5	Own	96	55

Manufacturers Whose Models Are Included in Specifications on Preceding Pages

Acason—Acason Motor Truck Co., Detroit, Mich.
Ace—American Motor Truck Co., Newark, Ohio.
Acme—Acme Motor Truck Co., Cadillac, Mich.
All-American—All-American Truck Co., Chicago, Ill.
Apex—Hamilton Motor Co., Grand Haven, Mich.
Armleder—O. Armleder Co., Cincinnati, Ohio.
Atlantic—Atlantic Electric Vehicle Co., Newark, N. J.
Atlas—Martin Truck & Body Corp., York, Pa.
Atterbury—Atterbury Motor Car Co., Buffalo, N. Y.
Autocar—Autocar Co., Ardmore, Pa.
Available—Available Truck Co., Chicago, Ill.

Beck-Hawkeye—Beck-Hawkeye Motor Truck Works, Cedar Rapids, Iowa.
Belmont—Belmont Motors Corp., Lewistown, Pa.
Bessemer—Bessemer Motor Truck Co., Grove City, Pa.
Bethlehem—Bethlehem Motor Truck Corp., Allentown, Pa.
Betz—Betz Motor Truck Co., Hammond, Ind.
Brinton—Brinton Motor Truck Co., Philadelphia, Pa.
Briscoe—Briscoe Motor Corp., Jackson, Mich.
Brockway—Brockway Motor Truck Co., Cortland, N. Y.

C. T.—Commercial Truck Co. of America, Philadelphia, Pa.
Chevrolet—Chevrolet Motor Co. of Mich., Flint, Mich.
Chicago—Chicago Motor Truck, Inc., Chicago, Ill.
Clydesdale—Clydesdale Motor Truck Co., Clyde, Ohio.
Collier—Collier Motor Truck Co., Bellevue, Ohio.
Columbia—Columbia Motor Truck & Trailer Co., Pontiac, Mich.
Comet—Comet Automobile Co., 156 S. Water St., Decatur, Ill.
Commerce—Commerce Motor Car Co., Detroit, Mich.
Concord—Abbot-Downing Truck & Body Co., Concord, N. H.
Conestoga—Conestoga Motor Truck Co., Lancaster, Pa.
Corbitt—Corbitt Motor Truck Co., Henderson, N. C.
Couple Gear—Couple Gear Freight Wheel Co., Grand Rapids, Mich.

Dart—Dart Truck & Tractor Corp., Waterloo, Ia.
Day-Elder—Day-Elder Motors Corp., Newark, N. J.
Dearborn—Dearborn Truck Co., Chicago, Ill.
Defiance—Defiance Motor Truck Co., Defiance, Ohio.
DeKalb—DeKalb Wagon Co., DeKalb, Ill.
Denby—Denby Motor Truck Co., Detroit, Mich.
Dependable—Dependable Truck & Tractor Co., Galesburg, Ill.
Diamond T—Diamond T Motor Car Co., Chicago, Ill.
Diehl—Diehl Motor Truck Works, Philadelphia, Pa.
Dispatch—Dispatch Motor Car Co., Minneapolis, Minn.
Doane—Doane Motor Truck Co., San Francisco, Cal.
Dodge—Dodge Bros., Detroit, Mich.
Dorris—Dorris Motor Car Co., St. Louis, Mo.
Douglas—Douglas Motors Corp., Omaha, Nebr.
Duplex—Duplex Truck Co., Lansing, Mich.

Ellsworth—Mills-Ellsworth Co., Keokuk, Ia.
Erie—Erie Motor Truck Mfg. Co., Erie, Pa.

F. W. D.—Four Wheel Drive Auto Co., Clintonville, Wis.
Fageol—Fageol Motors Co., Oakland, Cal.
Famous—Famous Trucks, Inc., St. Joseph, Mich.
Fargo—Fargo Motor Truck Co., Chicago, Ill.
Federal—Federal Motor Truck Co., Detroit, Mich.
Ford—Ford Motor Co., Highland Park, Mich.
Forschler—Forschler Motor Truck Mfg. Co., New Orleans, La.
Fulton—Fulton Motor Truck Co., New York, N. Y.

G. M. C.—General Motors Truck Co., Pontiac, Mich.
Gabriel—Gabriel Motor Truck Co., Cleveland, Ohio.
Garford—Garford Motor Truck Co., Lima, Ohio.
Gary—Gary Motor Truck Co., Gary, Ind.
Gersix—Gersix Mfg. Co., Seattle, Wash.
Giant—Giant Truck Corp., Chicago Heights, Ill.
Graham—Graham Brothers, Evansville, Ind.
Gramm-Bernstein—Gramm-Bernstein Motor Truck Co., Lima, Ohio.
Grant—Grant Motor Car Corp., Truck Division, Cleveland, Ohio.

Hahn—Hahn Motor Truck & Wagon Co., Hamburg, Pa.
Hall—Lewis-Hall Iron Works, Detroit, Mich.
Harvey—Harvey Motor Works, Detroit, Mich.
Hawkeye—Hawkeye Truck Co., Sioux City, Ia.
Hendrickson—Hendrickson Motor Truck Co., Chicago, Ill.
Hewitt-Ludlow—Ralston Iron Works, San Francisco, Cal.
Highway-Knight—Highway Motors Co., Chicago, Ill.
Higrade—Higrade Motors Co., Harbor Springs, Mich.
H & M—H & M Motor Truck Co.,Inc., Baltimore, Md.
Hood—Hood Mfg. Co., Seattle, Wash.
Hoover—Hoover Wagon Co., York, Pa.
Huffman—Huffman Bros. Co., Elkhart, Ind.
Hurlburt—Hurlburt Motors, Inc., New York, N. Y.

Independent—Independent Motor Co., Youngstown, O.
Independent—Independent Motor Truck Co., Inc., Davenport, Ia.
Indiana—Indiana Truck Corp., Marion, Ind.
International—International Harvester Co., Chicago, Ill.

Jones—Jones Motor Car Co., Wichita, Kans.
Jumbo—Nelson Motor Truck Co., Saginaw, Mich.

Kalamazoo—Kalamazoo Motor Corp., Kalamazoo, Mich.
Kankakee—Kankakee Automobile Co., Kankakee, Ill.
Keldon—House Cold Tire Setter Co., St. Louis, Mo.
Kelly-Springfield—Kelly-Springfield Motor Truck Co., Springfield, Ohio.
Keystone—Keystone Motor Truck Corp., Philadelphia, Pa.
Kimball—Kimball Motor Truck Co., Los Angeles, Cal.
King Zeitler—King Zeitler Co., Chicago, Ill.
Kissel—Kissel Motor Car Co., Hartford, Wis.
Kleiber—Kleiber & Co., Inc., San Francisco, Cal.
Knox—Knox Motors Co., Springfield, Mass.
Koehler—H. J. Koehler Motors Corp., Newark, N. J.
Kuhn—Kuhn Tractor Truck Co., Seattle, Wash.

Lange—Lange Motor Truck Co., Pittsburgh, Pa.
Larrabee-Deyo—Larrabee-Deyo Motor Truck Co., Inc., Binghamton, N. Y.
L. M. C.—Louisiana Motor Car Co., Shreveport, La.
Lombard—Lombard Auto Tractor Truck Corp., New York, N. Y.
Luedinghaus—Luedinghaus-Espenschied Wagon Co., St. Louis, Mo.
Luverne—Luverne Automobile Co., Luverne, Minn.

Maccar—Maccar Truck Co., Scranton, Pa.
Mack—International Motor Co., New York, N. Y.
Marshall—Marshall Mfg. Co., Chicago, Ill.
Master—Master Trucks, Inc., Chicago, Ill.
Maxwell—Maxwell Motor Co., Inc., Detroit, Mich.
Menominee—Menominee Motor Truck Co., Menominee, Mich.
Moreland—Moreland Motor Truck Co., Los Angeles, Cal.
Muskegon—Muskegon Engine Co., Muskegon, Mich.
Mutual—Mutual Truck Co., Sullivan, Ind.
Myers—E. A. Myers Co., Pittsburgh, Pa.

Napoleon—Napoleon Motors Co., Traverse City, Mich.
Nash—Nash Motors Co., Kenosha, Wis.
Nelson-LeMoon—Nelson & Le Moon, Chicago, Ill.
Netco—New England Truck Co., Fitchburg, Mass.
Niles—Niles Motor Truck Co., Pittsburgh, Pa.
Noble—Noble Motor Truck Co., Kendallville, Ind.
Northway—Northway Motors Co., Natick, Mass.
Northwestern—Starr Carriage Co., Seattle, Wash.
Norwalk—Norwalk Motor Car Co., Martinsburg, W. Va.

O. K.—Oklahoma Auto Mfg. Co., North Muskogee, Okla.
Ogden—Ogden Motor & Supply Co., Chicago, Ill.
Old Hickory—Kentucky Wagon Mfg. Co., Louisville, Ky.
Old Reliable—Old Reliable Motor Truck Co., Chicago, Ill.
Oldsmobile—Olds Motor Works, Lansing, Mich.
Oneida—Oneida Motor Truck Co., Green Bay, Wis.
Oshkosh—Oshkosh Motor Truck Mfg. Co., Oshkosh, Wis.
Overland—Willys-Overland Co., Inc., Toledo, Ohio.

Packard—Packard Motor Car Co., Detroit, Mich.
Paige—Paige-Detroit Motor Car Co., Detroit, Mich.
Parker—Parker Motor Truck Co., Milwaukee, Wis.
Patriot—Hebb Motors Co., Lincoln, Neb.
Piedmont—Piedmont Motor Car Co., Inc., Lynchburg, Va.
Pierce-Arrow—Pierce-Arrow Motor Car Co., Buffalo, N. Y.
Pioneer—Pioneer Motor Truck Co., Detroit, Mich.
Pittsburgher—Pittsburgh Truck Mfg. Co., Pittsburgh, Pa.
Pony—Minnesota Machinery & Foundry Co., Minneapolis, Minn.

Rainier—Rainier Motor Corp., Flushing, L. I., N. Y.
Reliance—Reliance Motor Truck Co., Appleton, Wis.
Rennoc—Rennoc-Leslie Motor Co., Philadelphia, Pa.
Reo—Reo Motor Car Co., Lansing, Mich.
Republic—Republic Motor Truck Co., Inc., Alma, Mich.
Reynolds—Reynolds Motor Truck Co., Mt. Clemens, Mich.
Riker—Locomobile Co. of America, Bridgeport, Conn.
Rock Falls—Rock Falls Mfg. Co., Sterling, Ill.
Rowe—Rowe Motor Mfg. Co., Lancaster, Pa.
Royal—Royal Motor Truck of N. Y., New York, N. Y.

Sandow—Sandow Motor Truck Co., Chicago, Ill.
Sanford—Sanford Motor Truck Co., Syracuse, N. Y.
Schacht—G. A. Schacht Motor Truck Co., Reading, Pa.
Schwartz—Schwartz Motor Truck Co., Reading, Pa.
Selden—Selden Truck Corp., Rochester, N. Y.
Service—Service Motor Truck Co., Wabash, Ind.
Shaw—Walden W. Shaw Livery Co., Chicago, Ill.
Signal—Signal Motor Truck Co., Detroit, Mich.
Standard—Standard Motor Truck Co., Detroit, Mich.
Sterling—Sterling Motor Truck Co., Milwaukee, Wis.
Stewart—Stewart Motor Corp., Buffalo, N. Y.
Stoughton—Stoughton Wagon Co., Stoughton, Wis.
Sullivan—Sullivan Motor Truck Co., Atlanta, Ga.
Superior—Superior Motor Truck Co., Atlanta, Ga.

Texan—Texas Motor Car Asso., Fort Worth, Texas.
Tiffin—Tiffin Wagon Co., Tiffin, Ohio.
Titan—Titan Truck Co., Milwaukee, Wis.
Tower—Tower Motor Truck Co., Greenville, Mich.
Traffic—Traffic Motor Truck Corp., St. Louis, Mo.
Transport—Transport Truck Co., Mt. Pleasant, Mich.
Triangle—Triangle Motor Truck Co., St. Johns, Mich.
Triumph—Triumph Truck & Tractor Co., Kansas City, Mo.
Twin City—Twin City Four Wheel Drive Co., Inc., St. Paul, Minn.

Union—Union Motor Truck Co., Bay City, Mich.
United—United Motors Co., Grand Rapids, Mich.
U. S.—United States Motor Truck Co., Cincinnati, Ohio.

Velie—Velie Motors Corp., Moline, Ill.
Victor—Victor Motor Truck & Trailer Co., Chicago, Ill.
Vim—Vim Motor Truck Co., Philadelphia, Pa.

Walker—Walker Vehicle Co., Chicago, Ill.
Walter—Walter Motor Truck Co., New York, N. Y.
Ward—Ward Motor Vehicle Co., Mt. Vernon, N. Y.
Ward La France—Ward La France Truck Co., Inc., Elmira, N. Y.
Watson—Watson Wagon Co., Canastota, N. Y.
Wells—Evans Truck & Axle Co., Auburn, Ind.
White—White Co., Cleveland, Ohio.
White Hickory—White Hickory Wagon Mfg. Co., Atlanta, Ga.
Wichita—Wichita Falls Motor Co., Wichita Falls, Tex.
Wilcox—H. E. Wilcox Motor Co., Minneapolis, Minn.
Wilson—J. C. Wilson Co., Detroit, Mich.
Winther—Winther Motor Truck Co., Kenosha, Wis.
Witt-Will—Witt-Will Co., Inc., Washington, D. C.
Wolverine—American Commercial Car Co., Detroit, Mich.

Price List, Capacities and Inflation Pressures of Large Size Pneumatic Tires

	36 x 6			38 x 7			40 x 8			42 x 9			44 x 10		
	Price	Carrying Capacity	Inflation Pressure	Price	Carrying Capacity	Inflation Pressure	Price	Carrying Capacity	Inflation Pressure	Price	Carrying Capacity	Inflation Pressure	Price	Carrying Capacity	Inflation Pressure
Amazon Rubber Co., Akron, O.															
Amazon Cord, non-skid	132.30	2000	106	.....	....	...	.....	....	...	.....	....	...	.....	....	...
American Rubber & Tire Co., Akron, O.															
Americord, non-skid	109.45	....	...	154.25	....	...	198.75	....	...	.....	....	...	.....	....	...
Bergougnan Rubber Corp., Trenton, N. J.															
Bergougnan Cord, non-skid	112.00	2000	90	146.50	2700	100	189.75	3650	110	232.25	4650	120	328.25	5800	130
Braender Rubber & Tire Co., Rutherford, N. J.															
Braender Super Cord, non-skid	110.40	....	...	156.10	....	...	201.15	....	...	.....	....	...	.....	....	...
Brunswick-Balke-Collander Co., Chicago, Ill.															
Brunswick Cord, Skid-Not	98.50	....	...	139.25	....	...	179.50	....	...	.....	....	...	.....	....	...
Curtis Tire & Rubber Co., Muskegon, Mich.															
Curtis Cord, Road	99.45	2200	90	.....	....	...	.....	....	...	.....	....	...	.....	....	...
Empire Tire & Rubber Co., Trenton, N. J.															
Empire Cord, Gray, non-skid	99.45	2000	90	140.65	2700	100	181.20	3650	110	.....	....	...	.....	....	...
Falls Rubber Co., Cuyahoga Falls, O.															
Falls Cord, Neverslip	112.00	2200	90	157.00	3000	100	200.00	4000	110	.....	....	...	.....	....	...
Federal Rubber Co. of Ill., Cudahy, Wis.															
Federal Cord, non-skid	99.45	2300	90	.....	....	...	185.00	4000	110	.....	....	...	.....	....	...
Firestone Tire & Rubber Co., Akron, O.															
Firestone Cord, non-skid	119.35	2200	90	168.80	3000	100	217.45	4000	110	272.35	5000	120	380.65	6000	130
Fisk Rubber Co., Chicopee Falls, Mass.															
Fisk Cord, non-skid	99.45	2200	90	140.65	3000	100	181.20	4000	110	.....	....	...	.....	....	...
General Tire & Rubber Co., Akron, O.															
General Cord, non-skid	106.25	2200	90	150.25	3000	100	193.65	4000	110	242.60	5000	120	338.90	6000	130
Goodrich, B. F. Rubber Co., Akron, O.															
Goodrich Cord, Ribbed	99.45	2200	90	140.65	3000	100	181.20	4000	110	.....	....	...	.....	....	...
Goodrich Cord, Safety	99.45	2200	90	140.65	3000	100	181.20	4000	110	.....	....	...	.....	....	...
Goodyear Tire & Rubber Co., Akron, O.															
Goodyear Cord, Ribbed	99.45	2000	90	140.65	2700	100	181.20	3650	110	.....	....	...	.....	....	...
Goodyear Cord, All-Weather	99.45	2000	90	140.65	2700	100	181.20	3650	110	226.95	4650	120	317.20	5800	130
Hewitt Rubber Co., Buffalo, N. Y.															
Hewitt Cord, non-skid	109.45	2000	90	.....	....	...	.....	....	...	.....	....	...	.....	....	...
Howe Rubber Co., Inc., New Brunswick, N. J.															
Howe Ultra Cord, non-skid	109.80	2000	90	.....	....	...	.....	....	...	.....	....	...	.....	....	...
India Tire & Rubber Co., Akron, O.															
India Cord, non-skid	108.30	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...
International India Rubber Corp., South Bend, Ind.															
Odell Cord, rough	99.45	2000	90	140.65	2700	100	.....	....	...	.....	....	...	.....	....	...
Kelly-Springfield Tire Co., Cleveland, O.															
Kelly-Springfield Cord, grooved	120.00	....	...	160.00	....	...	200.00	....	...	.....	....	...	.....	....	...
Kelly-Springfield Cord, BB	120.00	....	...	160.00	....	...	200.00	....	...	.....	....	...	.....	....	...
McGraw Tire & Rubber Co., Cleveland, O.															
McGraw Cord, ribbed	99.45	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...
McGraw Cord, non-skid	99.45	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...
Marathon Tire & Rubber Co., Cuyahoga Falls, O.															
Marathon Cord, Angle	107.20	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...
Mason Tire & Rubber Co., Kent, O.															
Mason Cord, non-skid	98.50	1700	100	139.30	2450	110	179.50	3300	120	.....	....	...	.....	....	...
Miller Rubber Co., Akron, O.															
Miller Cord, Geared-to-the-Road	104.70	2200	90	148.05	3000	100	190.75	4000	110	.....	....	...	.....	....	...
Mohawk Rubber Co., Akron, O.															
Mohawk Cord, non-skid	119.70	2200	90	.....	....	...	.....	....	...	.....	....	...	.....	....	...
Norwalk Tire & Rubber Co., Norwalk, Conn.															
Norwalk Cord, non-skid	117.00	2000	90	.....	....	...	.....	....	...	.....	....	...	.....	....	...
Oldfield Tire Co., Cleveland, O.															
Oldfield Cord, anti-skid	104.42	2250	90	147.68	2880	100	190.26	3660	110	.....	....	...	.....	....	...
Pennsylvania Rubber Co., Jeannette, Pa.															
Vacuum Cup Cord	108.40	2200	90	153.35	3000	100	197.60	4000	110	.....	....	...	.....	....	...
Portage Rubber Co., Barberton, O.															
Portage Cord, Daisy	120.00	....	...	160.00	....	...	200.00	....	...	.....	....	...	.....	....	...
Racine Rubber Co., Racine, Wis.															
Racine Multi Mile Cord, non-skid	98.20	2200	90	138.90	3000	100	178.95	4000	110	.....	....	...	.....	....	...
Republic Rubber Co., Youngstown, O.															
Republic Grande Cord, Staggard Tread	111.60	2200	90	157.85	3000	100	202.50	4000	110	.....	....	...	.....	....	...
Star Rubber Co., Akron, O.															
Star Cord, "All Star"	120.00	2200	90	160.00	3000	100	216.00	4000	110	.....	....	...	.....	....	...
Sterling Tire Corp., Rutherford, N. J.															
Sterling Cord, non-skid	130.00	....	...	175.00	....	...	230.00	....	...	.....	....	...	.....	....	...
Sterling Spec. Cord, ribbed	130.00	....	...	175.00	....	...	230.00	....	...	.....	....	...	.....	....	...
Swinehart Tire & Rubber Co., Akron, O.															
Swinehart Cord, Hexagon	101.45	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...
United States Tire Co., New York City.															
U. S. Nobby Cord	99.45	2200	90	140.65	3000	100	181.20	4000	110	226.95	5000	120	317.20	6000	130

Country-Wide Canvass Indicates Need of More Effective Transportaion Facilities

Keen interest is being manifested in results of a questionnaire sent out by Fourth Assistant Postmaster General Blakslee to 200,000 farmers throughout the country, to which 40,000 replies were received, inquiring how the high cost of living may be reduced, a digest of the replies having been sent to Congress by Mr. Blakslee. The farmers as a whole seem to agree among many other important problems directly related to them, that the facilities for getting farm products to market are poor.

Mr. Blakslee is striving to cure the trouble of poor transportation through the agency of the motor truck, operating as a part of the rural free delivery system of the department. Certainly, as shown by replies to the questionnaire, the farmer wants to deal directly with the consumer, if this can be brought about, and this suggests very pointedly the utilization of the motor truck in supplementing present transportation services.

Whether Congress will authorize extensive experiments by the postoffice department, in addition to those which have already been undertaken, remains to be seen. However, one result of the survey made by the department is certain to be such a centering of attention upon the possibilities of highways transportation, economically handled, as to give impetus to steps to that end being taken by others throughout the country.

General Blakslee has done the country a service, undoubtedly, in the comprehensive survey which he has carried out, and his presentation to Congress of the facts developed through it is already tending to focus interest on the problems presented and the methods for solving them.

Only the need for economy of the strictest kind on the part of Congress will prevent material support of it by the further experiments Gen. Blakslee desires to make.

TRUCK EQUIPMENT AND APPLIANCES

Jon-Con Tire Protector

A tire protector known as the Jon-Con, which when used is embedded between the tube and casing of the tire, was recently exhibited at the Philadelphia Show by the Jones-Conover Products, 2124 N. 15th St., Philadelphia. The insertion of



Jon-Con Inside Tire Protector

this protector is a simple matter as no cement is required. It is also designed to be used immediately in conjunction with the installation of a new tire casing, as it is claimed to increase the mileage of the tire. It also offers protection to the tube as it ably deflects nails or tacks or any other pointed debris of the road. Protection is also afforded against stone bruises by receiving the blow and distributing it over a large area, preventing the sharp impression in the casing which is detrimental to the life of the fabric. The price is from $5 to $14, according to the size.

Fabric Belt and Brake Lining

The modern Belt and Web Co., 201 Emerson Tower Bldg., Baltimore, Md., is producing various articles in the belting line for the automotive trade. Among these are the fan belting for cars and trucks, all sizes of friction rings, anti-squeak web and hood lacings, transmission linings, brake linings, fan belts for Ford cars, endless type and any length desired. This concern also makes a specialty of treating web for various purposes, especially the solid cotton beltings. One of their specialties is a 3-ply web belt in all thicknesses and widths for use on any car.

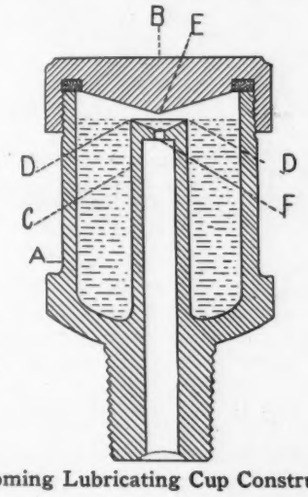
Blooming Lubricating Cup

The Blooming Cup manufactured by the Bloom Flusher Co., Tiffin, Ohio, is a device designed to feed automatically to the bearings a continuous stream of oil in the proper quantity proportionate to the speed and vibration of the truck. This cup is attached to parts where the wear on the bearings is great, such as the steering knuckles, shackle bolts and axles. It's entirely enclosed, excluding dust and dirt.

The action of this cup depends upon four factors: splashing, gravity, capillary attraction and suction. Excessive feed is retarded because the flow of oil from this entirely enclosed cup creates a partial vacuum. The cup is filled to the rim as may be seen in the sketch. There is an outlet "F" at the top of the stand-pipe "E" which retains the oil at the level "D-D". Any overflow in filling simply gives the bearings a preliminary flushing. After filling the cap is replaced and there is no further lubricating action until the machine is started.

After the truck is in motion, a surging action throws the oil against the inverted cone "E" of the cap "B". This oil flows down and drops from the apex of the cone. These drippings fill the concave top of the stand-pipe over the outlet "F". It is said to be held here until the capillary attraction from below caused by the flexing of the bearings draws the oil down. It is said that when the oil is as low as within 1-16 of an inch of the bottom of the cup it continues to splash sufficiently to keep the oil flowing to the bearings as required.

Filling is required only every 1,000 to 3,000 miles, according to the size of the



Blooming Lubricating Cup Construction

cup used. It is interchangeable with all oil or grease cups in present use, as this device has a ⅜-in. standard thread. Elbows are used to give a vertical position to the Blooming cup for instances where if the cups were attached they would be in an inclined position.

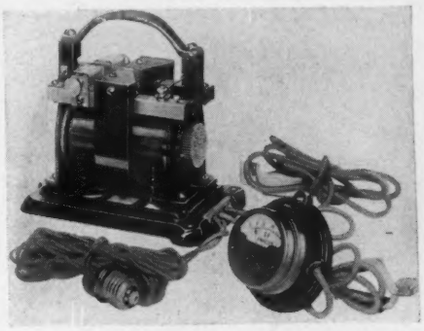
Charles S. Monson, 2115 Dime Bank Bldg., Detroit, Mich., is the exclusive sales representative.

Bantam Battery-Booster

The charging of storage batteries from the house-lighting circuit is made possible by two new models of the S. S. Bantam Battery Booster, recently announced by the France Mfg. Co., 1201 Rockefeller Bldg., Cleveland, O. It is similar in construction to the battery booster manufactured by this company, but smaller in design. It is made for only 110-130 volt 60 cycle alternating current circuits.

These two models are known as Type 6 and 12. The former charges one 6 volt battery at a 6 amp. rate and retails at $15, the latter charges one 12 volt battery at a 5 amp. rate and sells at $20.

The operation of this device is simple and automatic, and is not affected by line



Automatic Operating Battery-Booster

failures. If the current should be turned off the batteries cannot discharge because of the rectifier but when the circuit is closed the rectifier starts itself. The battery is charged without waste of time and at little expense.

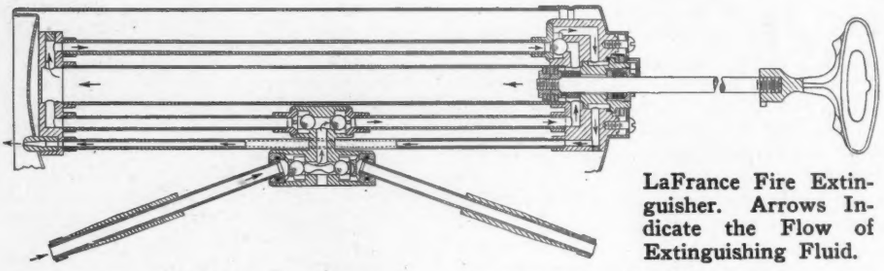
LaFrance Tetrachloride Fire Extinguisher

The American-LaFrance Fire Engine Company, Inc., Elmira, New York, is offering to the trade a double-acting, liquid pump, fire extinguisher known as the LaFrance No. 3, which discharges a carbon tetrachloride known as the LaFrance solution. This extinguisher is so constructed that no solder is used in any of the mechanical or fixed parts. The reason for this elimination is due to the fact that solder contains acid flux which is detrimental to carbon tetrachloride solution, causing corrosion. This pump is said to give a continuous discharge of fluid without a break in the stream from the first pull of the handle to the last push. A steady stream from 30 to 50 ft. is discharged by this extinguisher. It has a capacity of 1¼ qt., is 16 in. long, 3 in. in diam. and weighs 7½ lb. when full.

The pump takes suction through 3-16 in. brass tubes, one end of which is heavily weighted with composition metal and taped with felt, and the other end is attached by a packed ball and socket joint to the valve chamber. This connection enables the suction tubes to swing through an arc of 180 degrees with sufficient radius to cover both end surfaces of the container. The valve chamber is of composition metal and die cast and the ball checks are of brass, nickel-plated. The valves are operated by gravity with the assistance of lead weights. The pump cylinder consists of a 11-16 in. brass tube attached to the composition heads. The

piston is a brass cylinder covered by felt rings and attached to a solid rod and handle. A ball check controls the discharge of the fluid through the outlet seal and nozzle.

The LaFrance Fire Extinguisher fluid forms a heavy blanket of non-combustible gas immediately upon striking the fire. This gas excludes the air and smothers the fire.



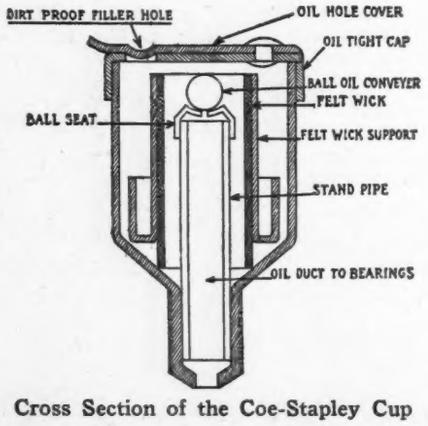
LaFrance Fire Extinguisher. Arrows Indicate the Flow of Extinguishing Fluid.

This fire extinguisher is furnished with a wall bracket complete for $12.00. Any quantity of LaFrance solutions can be obtained ranging in price of from $1.50 a qt. to $25 for 5 gal.

Coe-Stapley Lubrik-Oil Cup

A new oiling device that lubricates only while the car is in operation has been announced by the Coe-Stapley Mfg. Corp., 136 Liberty St., New York City. It is known as the Lubrik-Oil Cup. It is especially adaptable for any bearing surface where there is suffiicient movement to agitate the ball in this cup. Attention is required only every 2000 or 3000 mi. Dirt cannot enter, as there is a spring oil hole cover and any foreign matter in the oil settles in the bottom of the cup since the oil is fed by capillary attraction.

Oil is admitted through the filler hole. The motion of the car throws the ball, which acts as an oil conveyer, from its position, to one side and against the felt work. The ball thus comes in constant contact with the wick, which is held upright by the support and becomes covered with oil carrying it to the open-



Cross Section of the Coe-Stapley Cup

ing in the stand pipe, from where it is conveyed down to the bearing. The quantity of oil can be regulated by the size of the ball and also the speed of the car. In plain steel, these sell at $.50; nickel plated, $1. This oil cup is made in both the vertical and horizontal types.

New Transmission for Fords Providing Six Forward Speeds

A new transmission made exclusively for Fords providing them with six forward and three reverse speeds, and known as the Concord, has been brought out by the Broadway Tool & Machine Co., Inc., 717 Livingston St., Elizabeth, N. J. This provides the Ford with the standard gear ratio, an over-drive and an under-drive. The under-drive gives tremendous pulling power and the high gear under-drive provides a suitable gear ratio for steep hills. The Ford transmission is retained. Control of the new transmission is by a lever which, when in the center position,



This Transmission Provides Six Forward and Three Reverse Speeds.

engages the standard Ford speeds, the same as previously. With the lever pulled back, the under-drive is engaged and the car is operated in the usual way, the difference being that low gear is provided on both the low and high speeds. When the Concord transmission lever is pushed into its forward position, the over-gear is engaged. This transmission is made in the Model T for light delivery cars and others of 100 in. wheelbase; Model T. S. for light roadsters and racing cars and a Model T. C. for double chain-drive trucks using the 100 in. wheelbase Ford chassis. The gears of this transmission are made of chrome nickel steel, heat treated. Bearings are the Bound Brook oilless. The maker allows $7 for the Ford driveshaft tubes when turned in by the purchaser of a Concord transmission.

Tow Line of Fiber and Steel Cable Wire

A new tow line, claimed to remove the jerk and give more or less elastic action when towing a disabled car, has been offered to the trade by the Waite-Rhoads Co., 1455 S. Broadway, Denver, Colo. This is a cable of fibre and steel wire and is stated to have sufficient spring in it to take away that damaging and disagreeable jerk, sometimes experienced when towing, thus preventing loosening of springs or other possible damage to the car.

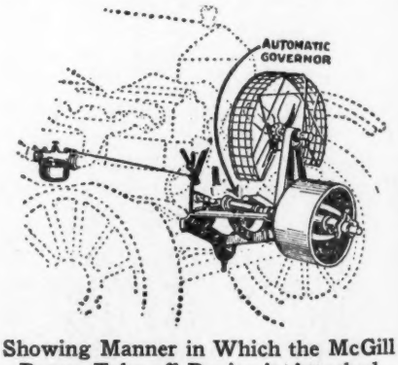
This tow line is made in two sizes, for passenger cars and trucks, 17 in. long and weighs approximately 5 lb. The retail prices are $6 and $8.



This Fiber and Steel Tow Line is Claimed to Have the Necessary Elastic Qualities.

The McGill Autopower Attachment

The Knight Metal Products Co. of 259 E. Willis Ave., Detroit, Mich., is marketing the McGill Autopower Attachment, a device to take power from the engine of a Ford for the driving of machinery. This attachment is helpful to the farmer and others where light machinery must be operated. It takes power direct from the crankshaft of the engine. The engine can be started in the ordinary way and the clutch thrown in. An automatic governor is used to maintain constant speed by increasing or decreasing the fuel supply. An auxiliary fan, with a guard, is mounted in front of the radiator to drive air through and thus keeps down the heat of the engine. The drive pulley is 10-in. diam. with 5¼-in. crown face. The speed of the engine, on the average is from 15 to 30 m.p.h.



Showing Manner in Which the McGill Power Take-off Device is Attached

Shipping weight is 100 lb. and the price, to the consumer is $87.50; west of the Rockies, $92.50.



Plant No 2 Making 3½ inch Tires and Tubes Exclusively

16,000 3½-inch tires and 25,000 tubes per day is the capacity of this new Firestone Factory, Plant No. 2, which is devoted entirely to this one size of tire—3½-inch—the size used by more than half the car owners of the world.

But the kind of 3½-inch tires this factory turns out is of more importance to car owners and dealers than the volume of its production.

All the floor acreage, all the special tire-making machinery, the carefully chosen and organized workers concentrated on this one job, spell one thing—

A better 3½-inch tire.

The service given by this highly perfected special molded tire proves again the ability of Firestone men to build the finest possible on a volume basis.

Firestone Tire Engineers developed this tire to raise even higher the Firestone reputation for quality.

Then Firestone Manufacturing Engineers developed the means of production that would give car owners the added benefit of a low price.

$7,000,000 is the financial investment put into this special tire that car owners might have this quality at such a price.

And when a Firestone dealer shows his customers a cross section sample of one of these tires, the quality can be seen and felt. It is generous in materials. It is a finished piece of workmanship.

Be sure the cars you equip have these better tires and insure your trade most miles per dollar.

FIRESTONE TIRE & RUBBER COMPANY
Firestone Park Akron, Ohio
Branches and Dealers Everywhere

Firestone

New Roller-Smith Electric Meters

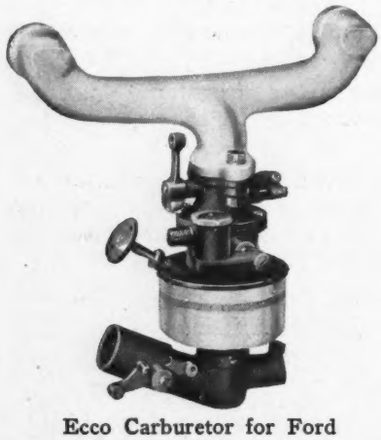
The Roller-Smith Co., 233 Broadway, New York City, has just recently added several new ammeters and voltmeters to its line. The new instruments are the Junor and 4-in. Imp. Ammeters, Voltmeters and Single Phase Wattmeters for alternating current. The production of these new models has been found necessary in order to supply the growing demand for the small size, round pattern, switchboard type of A. C. instruments.

The new A. C. instruments are especially adaptable to laboratories, motor-generators, and small switchboards, current rectifiers, battery charging outfits, etc. These small instruments have the same movement as the larger and more expensive switchboard models of the A. C. type and are really miniature counterparts.

The Junior Imp. type A. C. ammeters and voltmeters are furnished in capacities as high as 50 apm. and 150 watts. They need a base flange or flush case. The 4-in. Imp. A. C. ammeters and voltmeters are supplied in capacities as high as 50 amp. and 300 volts and the 4-in. Imp. A. C. wattmeter has maximum capacities of 30 amp. and 300 volts.

Ecco Carburetor

A new carburetor known as the Ecco and which is stated to enable the Ford to be throttled down to a very low rate of speed, has been brought out by the Economy Carburetor Co., Milwaukee, Wis. It has an accessible needle valve and a throttle lever with a stop screw for adjustment. A lock-nut is provided for the needle valve to insure permanent adjustment. A strainer keeps the dirt from the carburetor. It also has a choke for the dash control and the front control of the car. Heated air is supplied from around the exhaust to the air intake, at the bottom, the air passing up heating the fuel in the bowl. Thus warmed gasoline is fed to the initial mixing chamber, assisting in vaporization. Fuel and air are first mixed by the suction of the engine which draws the warmed air and a spray of gasoline into the initial mixing chamber. This mixture then passes through a widened center opening where a deflector or governor, controlled by the speed of the engine, moves up or down and regulates the additional air supply as occasion requires. This additional air is drawn through holes in the top of the air chamber and is so made to set up a swirling motion. The top of this mixing chamber is conical in shape, narrowing as it rises. The swirling vapor is drawn by the suction through this narrow opening which is stated to complete the vaporization.



Ecco Carburetor for Ford

Liberty Spark Plug

The insulator used in the Liberty plug, which is of Steatite, is the feature of this plug, a product of the Federal Corp., Westfield, Mass.

Methods of making the insulators from the clay Steatite have been perfected so that they withstand an extraordinary amount of abuse without breaking. The maker states rapid changes in temperature will not affect them and they can be bounced upon cement without damage.



Liberty Spark Plug
The insulator is made of Steatite

The plug is well made throughout. The shell is strong and is made of brass and therefore will not rust, this making the plug attractive. The electrodes are nickel alloy with ground electrode so bent that oil will not gather at the spark gap. This plug is made in all sizes and sells for $1.50.

Vapor-Tight Piston Rings

A two-piece piston ring of a leak-proof construction said to obviate the need of more than two rings per piston, is being manufactured by the Vapor-Tight Ring Co., Longfellow and 28th Sts., Minneapolis, Minn. The wearing surface of the vapor-tight ring, consisting of two distinct parts, is one piece, a feature that decreases the danger of cutting or scarring the cylinders. This ring is assembled so that the secondary or inner ring seals the outer slit. The slit in the inner ring is made on a radius so that the two lips will fit together at all times.



Vapor-Tight, Two-Piece Piston Ring

Two purposes are served by these two rings. The lower ring keeps the oil from entering the combustion chambers and the upper ring assures a more perfect compression.

The prices range from $1 for the 3-in. diam., ⅛ to ¼-in. wide, to $8.50 for 11-in., ⅜ to 1-in. wide. Sizes above this list cost from $.75 to $1 per diam. in.

Edwards Solid Cushion Tire

A new solid tire designed principally for truck use and built up in sections, each of which is removable, is being marketed by the Edwards Rubber Co., Akron, Ohio.

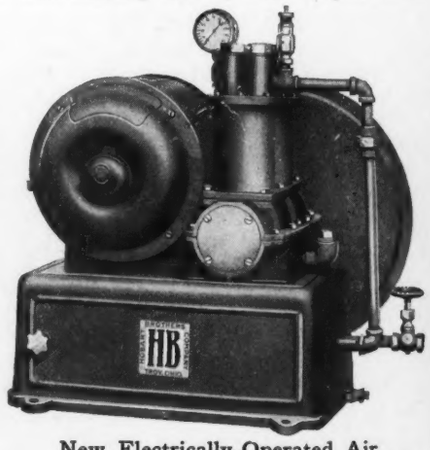
It is a sectional solid truck tire simply constructed and is made for standard wheels. Serious damage in any particular spot may be easily repaired by removing damaged section and inserting in its place a new section. This change does not in the least injure nor affect the tractive qualities of the tire and the repairs can be made without removing the wheel, thereby saving much time and inconvenience. Rubber creeping is said to be avoided by the use of bottom plates with cross corrugations.

The hard rubber base is firmly attached to the plate by vulcanizing through, under and around the anchors.

Automatic Air Compressor

A new compressor designed to relieve the garageman of all attention necessary in keeping up free air pressure for patrons, and known as the HB Compressor, is now being marketed by the Hobart Bros. Co., Troy, O.

It is a self-contained unit and may be immediately operated by simply connecting it up electrically. This device includes a ball bearing motor, which operates a large size two-cylinder slow-speed pump making 180 strokes per min., and pumping 3 cu. ft. of air per min. Measures of precaution have been taken against possible accident, due to high pressure, by the provision of effective safety valves.



New Electrically-Operated Air Compressor

Once connected to the electric current this compressor operates automatically and will supply air at standard pressure without further attention. An automatic starting device and an automatic cut-out regulates this. It pumps up to 135 lb. in pressure.

ROSS STEERING GEARS

PREDOMINATE at Motor Truck Shows

Whether you manufacture, sell or buy motor trucks, it must be deeply significant to you that one steering gear predominated overwhelmingly on motor trucks at the shows. Taking the Commercial Vehicle lists of exhibits, 44 out of 70 exhibitors at New York, and 47 out of 65 exhibitors at Chicago, use Ross Steering Gears as standard equipment.



As it was at the shows, so it is in the entire motor truck industry. Out of less than 250 manufacturers, 166 are building into their trucks the added assurance of *easy steering, safety* and *reliability* which Ross Steering Gears guarantee.

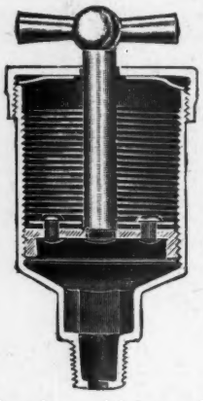
Further information gladly furnished to anyone interested in making, selling or buying a motor truck.

Ross Gear & Tool Company
760 Heath Street, Lafayette, Indiana, U. S. A.

The Steering Gears that Predominate on Motor Trucks

The Bowen Every-Bearing Grease Gun

The Empress Plunger Feed Grease Cup No. 214 manufactured by the Bowen Products Corp., Auburn, N. Y., effectively does the work of a grease gun. A feature of this gun is the fact that it is not necessary to attach it every time grease is required, as it remains on the



Bowen Grease Gun
One-half turn of the handle periodically, keeps the bearings well lubricated.

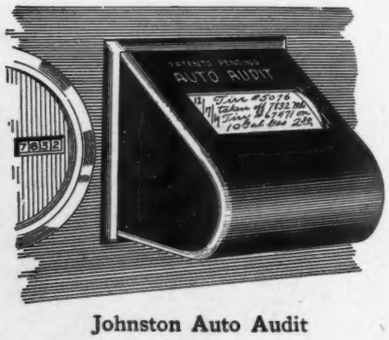
bearing without refilling for from 15 to 35 greasings, depending upon the size used and the part to be lubricated, thereby eliminating the necessity of attaching every time grease is required which would be necessary with the conventional type grease gun. This device is tested up to 1000 lb. pressure without leaking.

Attachment is simple and when grease is required, one-half turn of the handle will supply a sufficient amount of grease. In a few instances where the handle is inaccessible or cannot be readily reached, easy manipulation is afforded by special extension nipples.

These cups are drawn from rolled sheet steel, and are light and strong. The cap is effectively prevented from getting loose as it is fitted with a locking device which locks every quarter turn. The leather packing on the plunger is claimed to insure even pressure at all points. The Bowen Grease Gun is made from brass and steel in five sizes and in various finishes.

Johnston's New Expense and Mileage Recording Device

Accurate records on mileage per gal. of fuel, mileage of tires and figures on any other items are easily secured from a new recording device manufactured by



Johnston Auto Audit

the Wm. R. Johnston Mfg. Co., 359 E. Ohio St., Chicago, Ill., and designed for vehicular attachment. This device is mounted on the instrument board and serves as a constant reminder to the driver as its conspicuousness demands attention. The invaluability of this little device can be appreciated by those who desire to keep records on the running cost of a truck or car. By means of this device many little items of expense and memoranda, necessary for an effective cost system, can be jotted down at random.

This device consists primarily of a mechanically operated roll of tape, upon which the various items are recorded. A knurled wheel draws this across the opening on the face of the instrument. The capacity of this device is sufficient to retain a full season's supply of paper without the necessity of replacing. When necessary a new roll of paper can be inserted with little difficulty.

Steam Garage Heater

A heater that can be installed at a comparatively small cost, is the product of the Masdon Mfg. Co., 38 State St., Cambridge, Mass. The cost of maintaining this coal-burning system is small.

It will burn either gasoline or kerosene without odor. The outfit consists

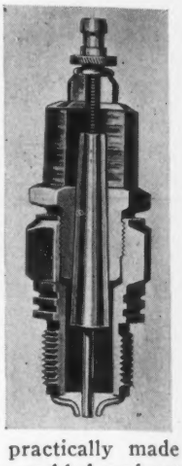


Masdon-System Garage Steam Heater

of a radiator, on cast iron standards, supporting a sealed iron box, protected by two layers of perforated brass screen, spaced one inch apart. The box contains a boiler with suitable conduits, an improved gas or a wickless kerosene burner, and an ignition device. The heater is made of cast iron constructed along the Davy's miners' lamp principle, which gives protection against fumes.

F. M. C. Spark Plug Contains No Porcelain

The F. M. C. Siper Spark Plug, manufactured by the Ford Mica Co., Inc., 14 Christopher St., New York, incorporates in its design many new features such as a large radiating surface, tending to keep it cool while operating; and a special grade of mica, a substitute for porcelain, which is made extra thick, making for longer life and durability. The plugs can be taken apart without danger of breaking any of its parts with an ordinary wrench to give access to the interior for cleaning. The plug has a wide open chamber, designed to retard accumulation of carbon deposits and to afford access for cleaning what carbon may collect.



F. M. C. Spark Plug
A special grade of mica substitutes porcelain.

These plugs are practically made by hand, each being assembled and set by hand. The retail price is $2.

Dearborn Grease Pump

The Dearborn Heavy Duty Grease Pump which has a capacity of 1 qt. of light or 2 lb. medium or heavy grease at each stroke is being marketed by the Dearborn Engineering & Equipment Co., 1703 Tower Bldg., Chicago. The 18-gauge tank is reinforced with a locking cover.

This apparatus is mounted on a heavy angle steel constructed truck with three large heavy-duty casters. Floor space of 21 x 19 in. is occupied by this truck. The piston which is adjustable for wear has three rings of composition packing. The rack and pinion are cut steel. The face gears are 1-in. The large port area valve is hand operated. The pressure may



Dearborn Heavy-Duty Grease Pump

be ascertained by a gauge which is provided with this outfit. The special heavy duty hose is 1-in. with three nozzles. This outfit lists at $1.25.

SIVYER CASTINGS

The Sivyer Service of providing Electric Steel Castings has for its objects the decrease of machining costs and the increase of wearing quality and life. Both are attained by methods which result from long experience and begin with the design of the casting itself. When we find that a casting we are asked to furnish is of a design not consistent with good foundry practice, we study its function in the completed unit and offer the necessary suggestions to make it a really practicable casting job without affecting in any way its function and efficiency.



Sivyer Steel rear axle pad and radius rod block used on Service Motor Trucks

Secondly: Sivyer Service analyzes the functions of the casting and specifies the proper composition steel for the job; long experience with carbon and alloy steels has enabled us to reduce costs and increase quality remarkably for many different industries.

Thirdly: Sivyer Service makes a careful study of the pattern and molding problems involved, for improper gating and insufficient risers are often the greatest wasters of machining labor and metal.

Fourthly: Sivyer Service analyzes carefully the proper annealing methods to be used and controls their proper application through unfailingly efficient equipment and men. In short, the Sivyer Service supervises every step necessary to secure unusually and unfailingly good castings of electric steel. It never relies on one factor alone, relies very little even on the natural freedom of electric steel from occluded gases and on its commonly recognized merits in resisting crystallization. It also depends but little on the inherent scientific accuracy of the electric furnace process. From casting-design to sand-blasting and tumbling, the fundamental superiority of Sivyer Steel is due to its men and metal. Their value is best proved by the fact that, although the production of steel castings is generally looked upon as a local one, the Sivyer market is national.

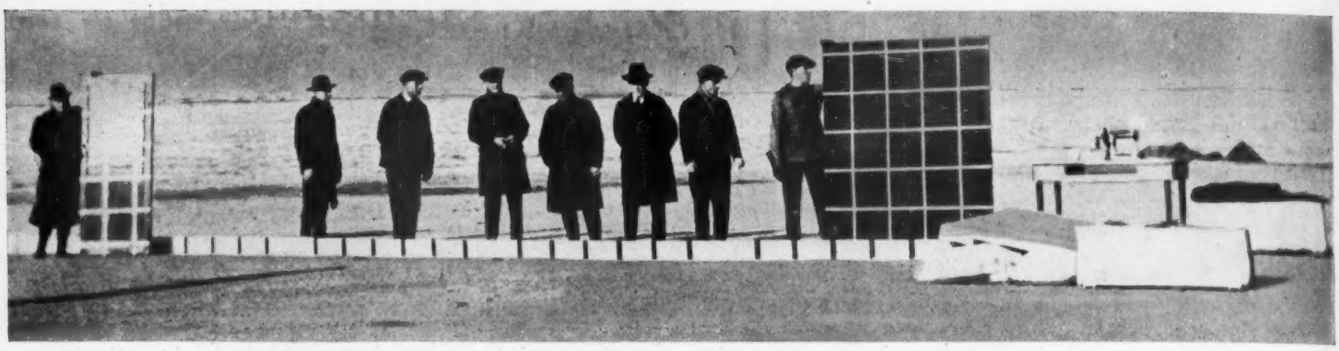
FOR parts having to oppose the continuous jolts and heavy shocks received in everyday duty, an increasing number of manufacturers in different sections of the country are coming to the use of a superior metal—Sivyer Electric Steel. The Service Motor Truck Co. uses Sivyer Castings for the rear axle pad and radius rod block because of their uniformly flawless quality and because of the superior resistance to crystallization and wear found in Sivyer Electric Steel. Attached to the rear axle, this part stands unfailingly the repeated jarring and severe driving strains to which it is subjected. Thus are Sivyer Castings bettering the performance and lengthening the life of America's leading trucks.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

Jumping Trucks Prove Pneumatic's Advantages

By ALFRED F. MASURY, Chief Engineer, International Motor Company



Apparatus Used to Make the Tests

The general layout; from the right the take-off, eighteen inches high at the edge, six feet long; the blackboard squared in feet to register height; the ground strips marked in feet to register jump; and a line-up of clockers, checkers and measures

WHILE engineers are agreed that pneumatic tires reduce road impact and resultant shock to the chassis and that the effect of light unsprung weight is similar, it was not until recently that actual tests were conducted to give physical proof of these assumptions. Such tests have been made by the International Motor Co., employing a novel type of motion picture for the close study of the motion of the parts while negotiating obstructions and striking the earth.

In these tests results were recorded photographically with a new type of motion picture camera by which pictures could be taken at the rate of 160 separate exposures per second, and which, when projected, "slowed down" at the action to one-tenth the normal speed. The results which have recently been announced were so convincing that one tire manufacturer has already begun similar tests to compare the impact effect of pneumatic and solid tire equipment on motor trucks.

The purpose of the tests, was to subject various types and sizes of trucks to shocks in excess of anything likely to be encountered in actual service and to make careful observations of the effect of road impact on spring and tire equipment as well as the effect of unsprung weight upon road impact. The trucks were run at speeds from 15 to 18 miles per hour along a straight-away and over a sharp incline rising 1½ feet high in a distance of six feet. They naturally sprang into the air and struck the ground as from a vertical drop of two or three feet. In each case the speed of the truck was determined by having it make a flying start and timing it with a stop watch over a measured course of 100 feet from a line to the base of the incline.

How the Tests Were Conducted

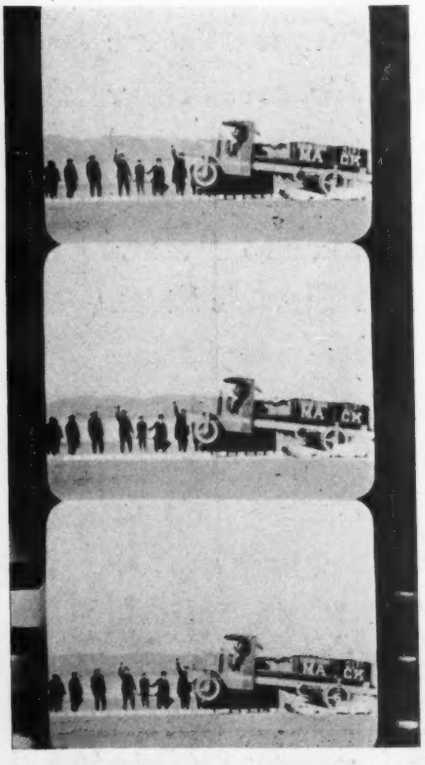
The time of flight through the air of each axle, the time of deflection of each spring and tire, the time of rebound of each spring and tire, and similar details of the tests were determined by several means to check the data for accuracy. An Eastman Kodak timer was used to show seconds on the motion picture films that were taken to record the tests. An ordinary hand sewing machine with a white card fitted on the plunger was set on the table in back of the incline, and so adjusted that the card rose and fell three times with each revolution of the crank. This was operated by a man with a stop watch who turned the crank three times per second. A phonograph motor and turntable mounted in a box was placed on the stone buttress at the near side of the incline, the turntable carrying a cardboard cylinder marked off in four sections in black and white, the first, solid black, the second white on top and black at the bottom, the third, solid white, and the fourth black on top and white at the bottom. The governor of the motor was set for 60 r.p.m., so that the pattern on the cylinder showed quarter-seconds.

All of these instruments were put into action simultaneously with the running of each truck over the incline and recorded together both by still and motion pictures.

Distance. The horizontal distance which the trucks jumped was measured by a curbing along the back of the runway marked off in feet.

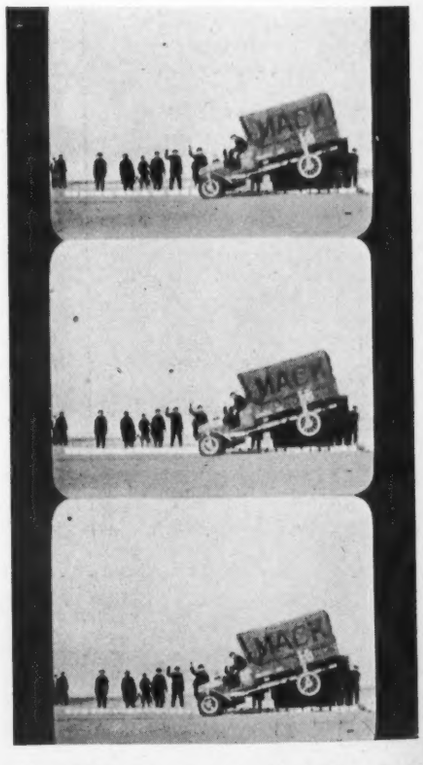
Height. A large blackboard near the incline, marked off in feet both vertically and horizontally, showed the vertical rise of the different portions of the truck.

Revolutions of Wheels. The rims of the tires, one spoke on each wheel and the hub-caps were painted white.



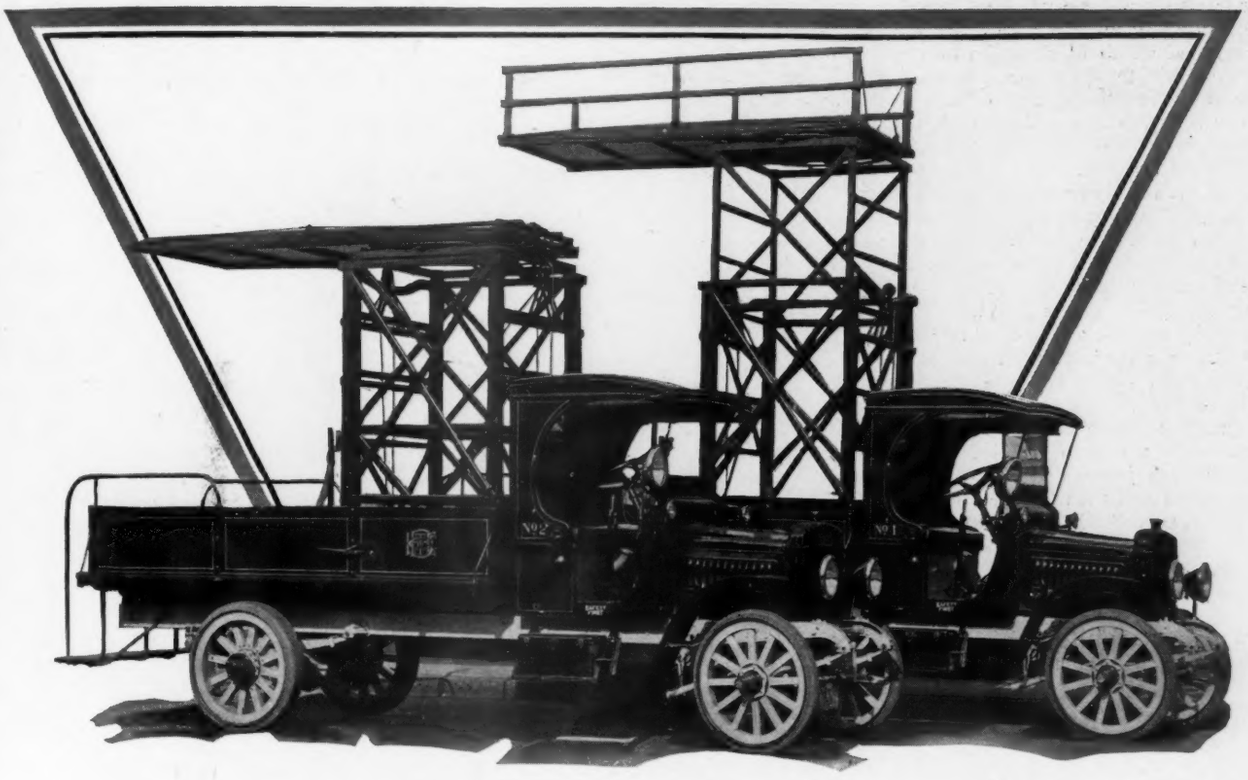
Solid-Tired Truck Weighing 11,870 Lbs. Leaving the Take-off at 15 m.p.h.

The timing devices are well shown on the concrete block to the left of the figure



Mack Two-Tonner Landing Seventeen Feet Three Inches From the Take-off

The compression of the pneumatic tires gives an index to the blow absorbed by them



The Atterbury in the Street-Car Business

"We have had in use ATTERBURY TRUCKS for emergency line work, tower construction work and general carting, since 1912, and these trucks have given very satisfactory service. We believe that they will stand the test equally as well as any truck known to us on the market."

INTERNATIONAL RAILWAY CO.

10 years of truck making experience behind each ATTERBURY

You may be able to get an Atterbury Dealership if you write or wire now

ATTERBURY Dealers are proud of the way Atterbury Trucks make good in every line of business.

Especially does the Atterbury shine where conditions are the hardest—and work the most continuous.

The street-car business is just one good example.

ATTERBURY MOTOR CAR COMPANY, BUFFALO, N. Y.

ATTERBURY

MOTOR TRUCKS OF MAXIMUM SERVICE

Deflection. A strip of sheet metal extended down from the lip of the fender was marked off in black and white at 3-inch intervals to show the rise and fall of the hub. The tire deflection was measured by means of the white rims and the white spoke enabled the revolutions of the wheel to be counted.

In addition to numerous still pictures with different forms of cameras, two kinds of motion pictures were taken to permit analysis in the laboratory. One of these was the standard motion picture machine taking 16 exposures per second and the other a Novograph, a new type of camera which takes pictures nine times as fast as the normal projector, or 144 separate exposures per second. Each jump was photographed simultaneously by both cameras and a composite film made up in which each jump was shown first at normal speed and then "slowed down" by the Novograph. This film was then projected at normal speed, whereby each jump was shown twice, the first time, as it actually appeared and then at one-ninth normal speed, which allowed the human eye to trace the intricate movements of the different parts as the flight through the air was made.

These films were studied both running and still, accurate measurements and calculations made and conclusions definitely arrived at.

True to Theoretical Assumptions

The trucks tested comprised the following: One standard Mack AB 1½-tonner having pneumatic tires on front and solids on the rear, and an experimental gear-driven axle; an AB 2-tonner with pneumatic tires all around and the same type of rear axle; an experimental 3-ton truck; a 3½-ton chain-driven AC model and a 5½-ton AC with an experimental chain drive.

The conclusions drawn from the tests showed that the impact of a truck striking the ground after bounding over an obstruction is approximately increased as the square of the speed and as the weight, but inversely as the resiliency of the springs and tires. This means that while at given speed twice the weight will strike the ground with twice the force from a given height, if the same weight strikes the ground at twice the speed, it will strike the ground four times as hard; but that springs or tires twice as resilient will cause the impace to be only half as much.

It will be seen that two of the trucks were of very similar design, one having solid rear tires and the other pneumatics all around. A comparison of the results shown by these two gives startling conclusions.

The one with solid rear tires weighed 9,730 pounds and the one on pneumatic tires 10,200 pounds. The lighter one had 6,400 pounds on the rear tires and the other 7,100 pounds. The former had 1,000 pounds spring deflection per inch and the latter, 1,183 pounds.

Going over the jump at 17-1-10 miles per hour this lighter truck jumped 17 feet 3 inches, the other 17 feet 7 inches. Thus they jumped about the same distance at the same speed. Their weight was similar and they had about the same proportion of sprung to unsprung weight. Their springs were also similar, and yet when the forces set up by the shock of landing were figured an astonishing difference was found which could only be accounted for by the difference in tire deflection between the solid and pneumatic tires.

The solid-tired truck showed a spring deflection 3¼ inches and a tire deflection of 1 inch. The pneumatic-tired truck showed a 5½ inches spring deflection and 4½ inches of tire deflection, all of these figures being taken on the rear wheels only. The force with which the unsprung portions of the solid tired truck struck the ground was 14,336 pounds as against but 4,624 on the pneumatic-tired job. Those on the sprung portions of the solid-tired truck were 13,114 as against 9,282 on the pneumatic-tired one.

Pneumatics Hit the Ground With Less Impact

From this we see that whereas the pneumatic-tired truck had 620 pounds more weight on the rear axle, it went over the same jump at the same speed as the solid-tired one, but owing to the greater deflection of the pneumatic tires, 450 per cent. greater than the solids, it hit the ground less than two-thirds as hard. In other words its unsprung impact on the ground was 9,712 pounds or 68 per cent. less than that of the solid-tired truck. This was not directly due entirely to tire deflection, of course, for we have seen that there was greater spring deflection, but this is all the more remarkable, for we know that these springs were 183 pounds each, or 366 pounds for both rear springs, stiffer than those of the solid-tired truck. The only way it can be accounted for is that the deflection of the pneumatic tires served to so lessen the rebound of the unsprung portion of the truck as to give the effect of lighter unsprung weight and consequently to lessen the resistance of the axle to the deflection of the spring. This represents the effect of impact on the road. The forces acting through the sprung portions of the truck represent the reaction of the blow on the vehicle itself. The sprung force was 3,732 pounds or 29 per cent. less on the pneumatic-tired truck than on the solid-tired one, which is natural, considering that less impact of the unsprung portions of the road would produce less reactive thrust on the frame.

The pneumatic therefore saved the road two-thirds the grief and the vehicle itself one-fourth. Following the thought to its logical conclusion, it would seem obvious that a 7½-ton truck on pneumatic tires would do less damage to the road than a 5-tonner on solid tires, operating over the same route and at the same speeds.



A Five and a Half Tonner Taking Off a Fifteen-Foot Jump

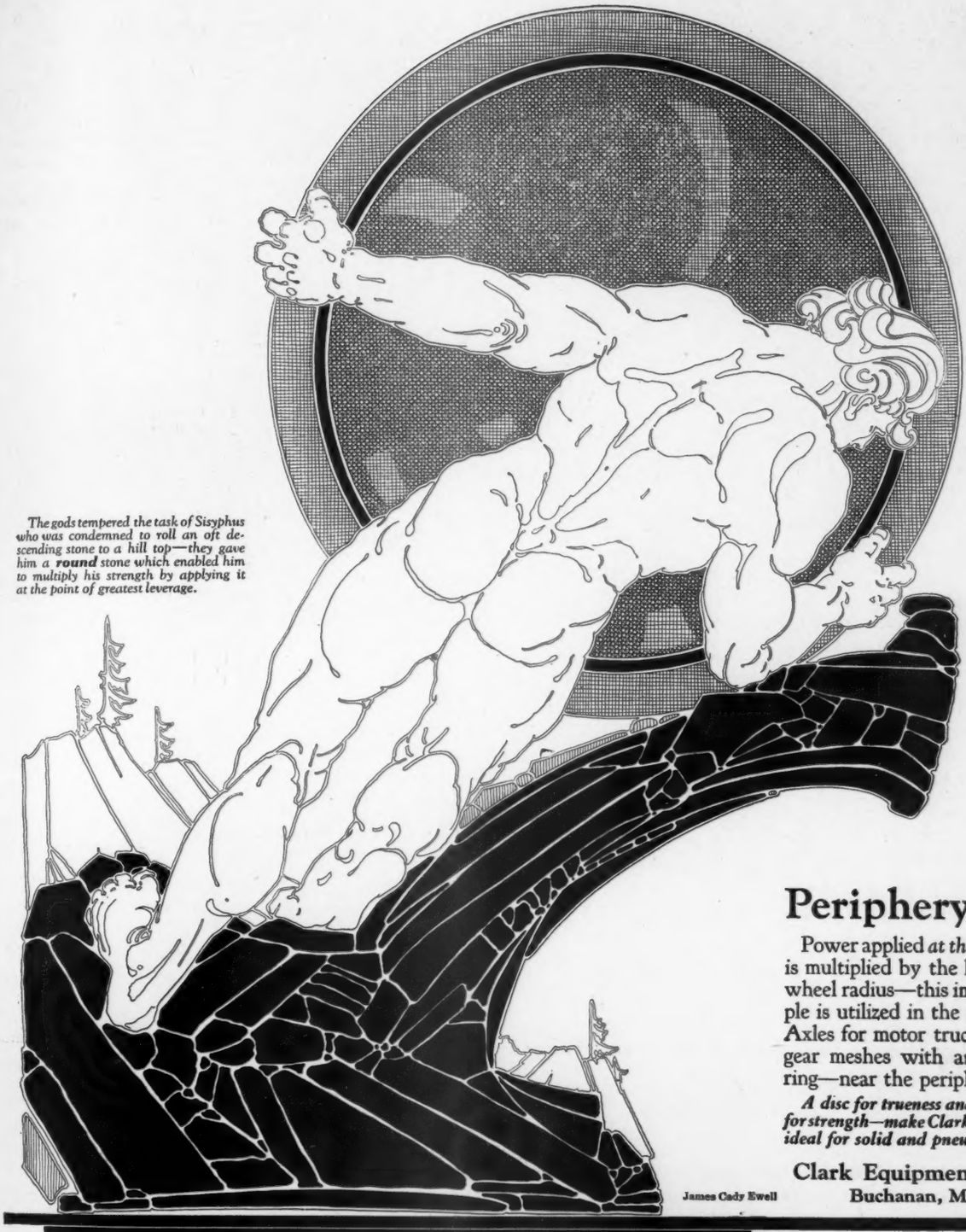
The blackboard in the rear is ruled off in one foot squares, and thus the height reached by the truck can be readily ascertained. In the same way the baseboards are marked off at one-foot intervals and so show the distance covered. By examining the motion picture film for any desired instant the position of the truck can be accurately located for that instant. Thus in this picture it is seen that the front wheels are two feet clear of the ground, and that the truck has traveled nine feet since they left the take-off. The uprights depending from the chassis by the hubs were painted as shown in alternate three-inch bands of black and white. These show in the photographs of the umps the amount of spring deflection.

Master Map of Country's Highway System Under Way

A force of highway engineers, draftsmen and topography experts are in the midst of preparing one of the most extensive systems of maps and charts of America's highways system ever compiled. This work is being done at headquarters of the Goodrich Travel and Transport Bureau, Akron, Ohio.

During the war period the bureau laid out routes for the army military convoys, and since then a country-wide survey has been conducted. The exhaustive data and material gathered has enabled the compilation of routes connecting all centers of population in the United States.

The preparation of maps is but one step in the bureau's program to assist in establishing rural motor express lines in every community in the country where there is need for this service. Industrial districts and agricultural areas from coast to coast have been studied by the experts and through the co-operation of 120 representatives in the field, scores of automobile and truck manufacturers, highway transportation companies and highway officials, a comprehensive campaign is now under way.



The gods tempered the task of Sisyphus who was condemned to roll an oft descending stone to a hill top—they gave him a ***round*** *stone which enabled him to multiply his strength by applying it at the point of greatest leverage.*

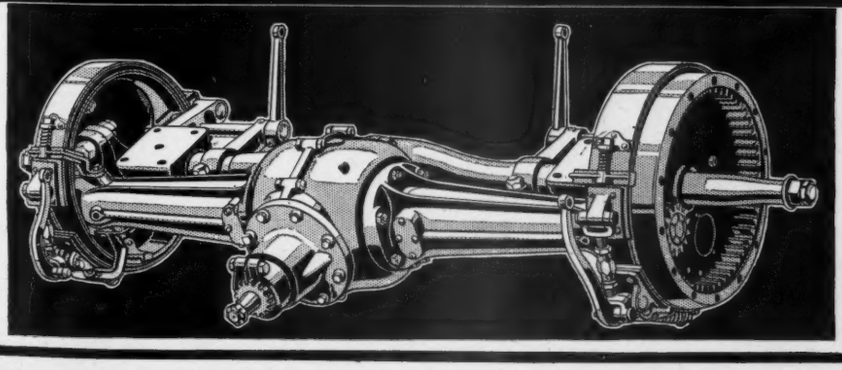
James Cady Ewell

Periphery Power

Power applied *at the rim* of a wheel is multiplied by the leverage of the wheel radius—this important principle is utilized in the design of Clark Axles for motor trucks. The spur gear meshes with an internal gear ring—near the periphery.

A disc for trueness and resiliency—steel for strength—make Clark Steel Disc Wheels ideal for solid and pneumatic truck tires

Clark Equipment Company
Buchanan, Michigan



Write for informative literature

CLARK
Rear Axles-Steel Wheels-Locking Differentials
For Motor Trucks
EQUIPMENT

CLARK INTERNAL GEAR DRIVE MOTOR TRUCK AXLES

Buffalo Dealers to Cash in on Sales as the Result of Building Boom

Live Dealers Are Laying Sales Campaigns to Contractors and the Building Trades. The Trade-in Evil is Much in Evidence

By C. S. PERRIE

BUFFALO, N. Y., Feb. 20.—Recent purchases of land by large industrial concerns on the Niagara frontier indicate, according to those closely in touch with industrial conditions, that there will be a gigantic building boom during the coming season. Real estate experts report numerous inquiries from out of town companies which have investigated factory sites and labor conditions and that many of these will locate in and around this section. Several million-dollar plants are being planned and a number of new constructions are under way. Several established concerns have outgrown their quarters and will erect substantial additions. One concern alone will require about 8000 new employees and a number of others will need help which means many thousand new workmen must be housed and cared for. It also means a wonderful opportunity for the truck dealers of Buffalo to merchandise trucks to contractors and all concerns directly and indirectly connected with the building trades.

It is said that labor conditions are better here than elsewhere, that the federal census credits Buffalo with the lowest labor turnover in the country. This coupled with the co-operative spirit existing between labor and employer is said to have attracted many new concerns to this city and vicinity. There is a community spirit permeating every industry, and in many sections get-together meetings of manufacturers, transportation and utility corporations are held to co-ordinate home building campaigns for the big problem in expansion—the housing of employees. Tonawanda exemplifies this spirit as several million-dollar corporation are building and other structures are to be built.

Planning Sales Campaigns

Some of the live wire truck dealers here are active in this tremendous industrial development and are really selling trucks at a time of year when weather conditions largely confine their use to the city and suburbs. This is particularly true this month, which has been a record breaker for snow storms and blizzards that have built huge drifts on the highways connecting the city with adjoining towns. Despite these conditions some dealers have mapped out an intensive selling campaign to contractors and building trades. And one company sold 15 trucks this month, up to the time this article was prepared. The head of this concern informed the writer that he is confident that his sales will exceed those of any previous winter when highway conditions were more favorable. This company as well as another, is pushing a very active campaign among the highway contractors as many miles of new road will be constructed in this section as well as resurfacing done. The older and more experienced truck dealers anticipate a record selling season and appear to be more worried over deliveries than prospects.

The Trade-in Evil

Buffalo, in common with other large cities, has a type of truck dealer that is under the influence of the "shopper." In other words, the trade-in problem appears to be a serious one among some dealers, particularly that class that has not learned by bitter experience that taking in an old truck and making too great an allowance for same eventually leads to bankruptcy. Like New York, Buffalo has the gyp purchaser, the prospect with an old truck and who shops to secure the maximum allowance in trade. It is the same old story of the prospect playing one dealer against the other, an old form of gyping but a successful one with the new or inexperienced truck dealer.

If the trade-in were confined to trucks it would be bad enough but when the problem involves the exchange of horses, wagons, harness, office equipment, etc., it is becoming serious. One dealer told of his experience with a prospect who insisted on a horse being taken as part payment for a truck. Fortunately this dealer proved a David Warfield for he placed a very low value on the animal which he sold the next day. A less experienced dealer would have suffered a loss.

The unfortunate part of the trade-in evil here appears to be the lack of foresight on the part of the dealer. Several of the big dealers here say that the greenhorn dealers are exchanging new trucks for old ones and in many instances are making allowances which will not permit of breaking even, let alone making a profit. It was explained that these dealers during the dull season are influenced by the shopping style of purchaser to make an extraordinary allowance for the old truck, that the roll of cash the shopper flourishes has a hypnotical effect on the dealer desiring to make some turnover that will net him cash to care for his winter overhead.

One dealer who is an old timer prescribes a remedy for what he terms his "faint hearted brother dealers." He said that the best remedy he knows of through experience is to consult his sales records during any period of the year when sales are not booming. "I find that by looking over my records that I have experienced worse periods than the case in hand and I immediately buck up and put more pep in my salesman, quoting the records of the bad times. Now the new dealer, the brand new, may not have these records to consult, but if he will profit by the experience of the older and more successful truck dealer he will think twice before allowing the shopper to influence him with the cash offer and a trade-in. My message to the dealer who is and has been loaded up with a bunch of old trucks is to charge off his losses to experience and make a cast iron rule not to accept any truck as part payment unless he knows—mind you I say knows—that he can sell the old truck at a real good profit, and a profit over the cost of placing the trade-in in running condition, interest on money, cost of advertising, selling, etc.

"If the dealer who is falling for the shopper will do a little figuring and establish a profitable trade-in price, and stick to it when cajoled by the shopper, he will do much towards curing the trade-in evil. I know it takes courage to refuse attractive cash offers with an old truck but I am sure I am stating it correctly when I say that the successful truck dealer, one who has been in business for years and who is making real money, has been through the mill and knows that swapping new trucks for old ones with too big an allowance can't be done." This dealer does not believe a gentlemen's agreement among dealers not to cut prices in the form of trade-ins is practical, neither did he believe that any association could be formed that would remedy conditions. He believed that experience was essential to teach the lesson and that it was the "burned child that dreaded fire."

Paying More Attention to Service

The writer found in his talks with dealers here that many are awake to the value of service and its relation to sales. Effort is being made by several to educate their salesmen as to what service really is, what it means; to teach the salesman not to allow his enthusiasm to carry him away when trying to close a difficult sale. In other words effort is being made at meetings to bring about a personal contact between the service manager and the customer, allowing the former to explain the service policies rather than the salesman, and to show the customer that the station really has parts.

The L. G. Schoepflin Co., distributor for the Selden, Transport and Collier trucks, is an example of the tendency to supply high grade service. This concern has taken over the Pierce-Arrow Cycle Works Building and is converting it into a model truck service plant. It affords 60,000 sq. ft. of floor space and modern equipment will be installed for service trucks. Distribution of parts for the associate or sub-dealers will be effected from this station.



Read how the manager of THE HOWARD REFRACTORIES COMPANY, Dorsey, Maryland, saved contracts by keeping his firm's busy trucks eternally on the job.

"BUT for 'NOBBY CORD' PNEUMATIC TIRES our trucks would have been useless last winter, as solid tire equipment invariably stuck in the mud before reaching our plant."

"Since July, 1918, 'NOBBIES' have served us under capacity loads of heavy fire brick and weighty materials and to date a slight nail puncture is the only sign of depreciation."

'NOBBY CORDS' mean—less operating expense—increased speed—reduction in mechanical repairs and vibrations—decrease in gasoline consumption—decrease in oil consumption—greater traction—elimination of breakages—less depreciation.

'Nobby Cords' Save in Every Phase of Truck Operation



Opportunity in the Automotive Trade With Russia

(*Continued from page 31*)

road usually is but one and beyond are only plain dirt roads. But even in America the author found quite close to the great centers many roads which were almost impassable for motors; nothwithstanding mention in the Official Blue Book as fairly good roads.

In Poland, in Crimea and in Caucasus the net of roads is much thicker for various reasons. In Poland there are specially built military strategical roads always kept in perfect shape. In Crimea they were built because the emperor and all his relatives had their country palaces there, and in Caucasus in the highest mountains the railroads would be too expensive.

This shows us that in Russia the roads can be as good as in any other country and certainly with the development of the automotive field we would see new roads built and old ones improved as quickly as in this country.

Russian "chaussées," as people call them, are not too bad, and this is proved by the fact that very high speed could be obtained on the ordinary Russian roads. During the races and great reliability trials a speed of over 100 miles was attained and on a distance of 400 miles the average speed of the winner was nearly 70 m.p.h.

Several auto tourists crossed all Russia and everywhere found the roads quite fair. The ordinary unimproved dirt roads sometime are even better than the "chaussées," especially in the south. During the dry season they present a very smooth and running surface, but after rains are usually for several days transformed into puddles of sticky mud and then not only autos but horse vehicles cannot navigate them.

We must admit however, that almost all of the plain dirt roads can be easily and with relatively small expense transformed into tolerably good roads for motor use and as soon as more motor trucks and passenger cars are sold in Russia—the road itself will be improved rapidly.

Truck Transportation Demanded Roads

People usually tell us that motor cars can not become popular in Russia as long as there are no good roads and an adequate amount, but we must remind them of the progress of the automobile in America. Comparatively few years ago America had no roads at all and only the development of automobiles induced people to build new roads and in a very short time all the country was covered by a network of improved roads.

The freight and passenger service by motor cars began to develop itself in Russia only in the last few years. Where the conditions of roads permitted the regular service was organized, namely,—in Poland, in Caucasus and Crimea where there are no railroads.

Not only in Russia proper but even across the border to Persia, to Teheran, autobuses were running and their service was quite satisfactory. Autobuses were regularly operating in several cities despite very poor street paving.

As to Russia's automobile industry, we are compelled to acknowledge that it was in its infancy when the war changed all quite unexpectedly, so it is rather hard to foresee in what way it will develop in the future.

In the pre-war time in Russia there was only one factory in Riga, making about 500 autos per year, but in 1916 the government decided to start the same production on a larger scale and subsidized five factories to build up a new automobile industry in Russia of her own. Subsequently five factories were erected and the revolution found them almost already to produce motorcars; since the revolution probably no new steps in this business were taken but we can expect the further development of this line in the very nearest future.

Approximately 7000 or 8000 motor cars can be produced yearly in these factories and to be sure this amount can not satisfy the demand for the same in Russia.

In Russia there were two factories making auto tires—"Provodnik" and "Treugolnik," both producing high grade tires.

Russia runs in second place, with America first, in the world's production of petroleum and gasoline. The pre-war prices were compartively low, the gasoline about 20c per gal., and kerosene about 15-20c per gal.

Filling Stations Needed

No filling stations existed in Russia and in this line the greatest field lies opened for energetic people and for large companies selling the full equipments for these stations which undoubtedly will be in great demand as soon as the auto trade with Russia will be resumed.

The organization of Russia's own production of motor cars requires too long a time and probably for many years will not be sufficient for the needs of the country—therefore it will be prudent to build at this time only factories for assembling parts brought from America, and gradually let Russia produce her own parts, thus coming to the creation of her own production.

Several of those factories can be opened at the same time and doubtless they all will work successfully and the orders for a long time will surpass their capacity.

The American auto-industry with its vast ability must come to the aid of Russia without fear or faltering and start a real development of the auto-trade before the others do so, especially Germany.

All these briefly summarized conditions show that the richest, new market offers an endless field of opportunities for energetic and capable men.

Russia's resources are still great and we dare say that her paying ability will soon surpass that of many countries. Her gold resources are now greater than that of any other country and her natural richness is incalculable.

We need only mention the gold and platinum fields which are not only inadequately exploited but for the largest part wholly unexplored and only known to exist. Gold and platinum are Russia's greatest assets and assure her solvability.

The raw materials already amassed by the Russian government to be shipped abroad presents an inestimable fortune and it will be sent at the first possibility as payment for the goods which Russia needs the most.

Among these goods, automotive products are first on the list and the American auto-industry has the chance to take the best part of this new market, the richest and the most important, which by no means should be neglected by the United States trade.

How to organize the relations with Russia and which is the best way to resume the trade and to send over there different American goods is naturally the question asked.

Consult Russian Experts

The best solution of this cardinal question seems to lie in the organization of a big American corporation of manufacturers which can be interested in trading with Russia, and with several well known Russians as consulting advisers, selected from the best experts in this matter, familiar with Russian conditions, with the demands of Russia and with the ways to be adopted in this trade.

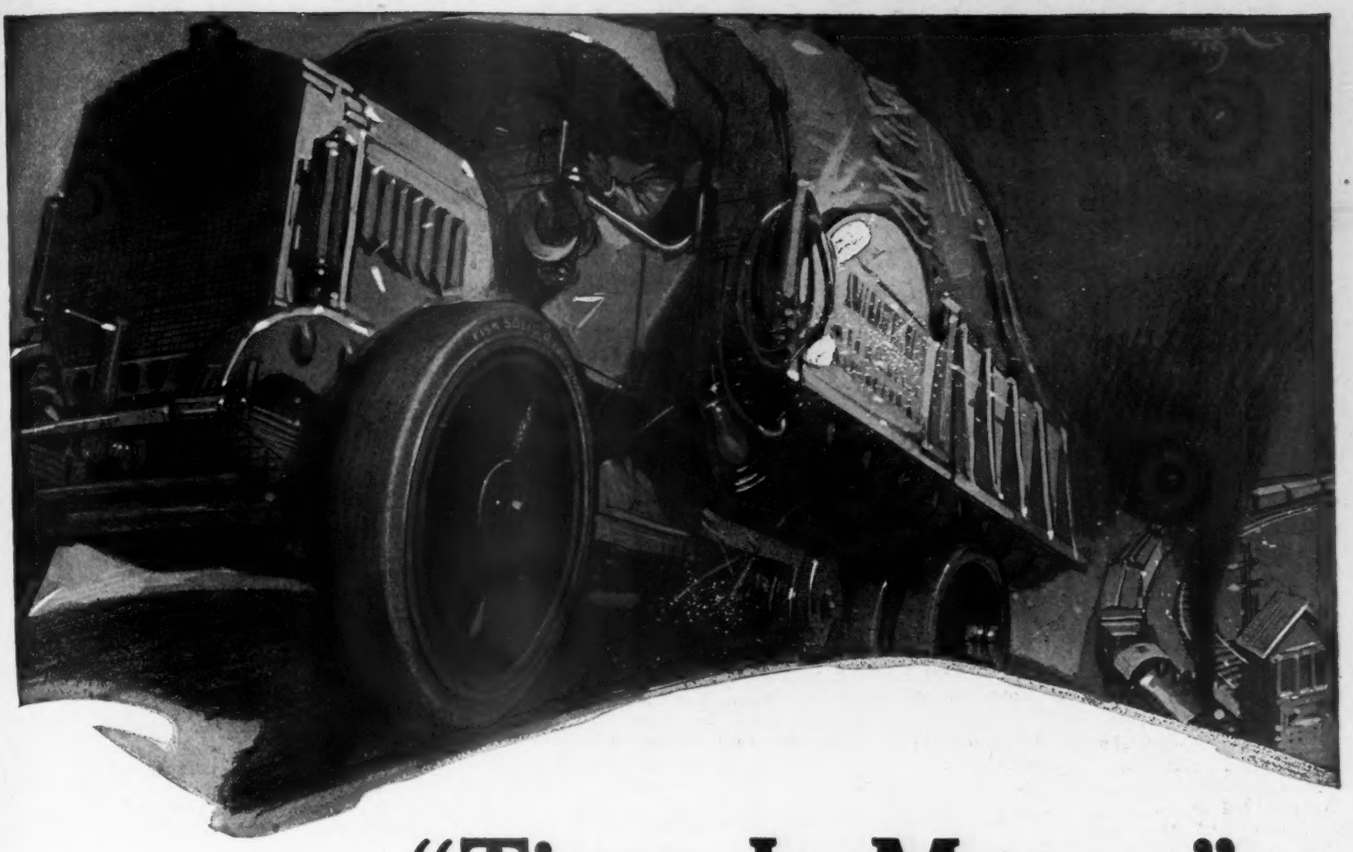
Such a corporation with sufficient funds and large resources to send all kinds of goods into Russia at once, will doubtless be wholly successful and will eliminate all competitors.

With the present abnormal state of things this seems to be the only sure and advantageous way, because there is a small chance for a private party to make a real success in the country where only co-operative methods under the government control are being dealt with by big business and the strength of a lone man will be entirely absorbed in the mighty stream of united workers. Only a great and powerful corporation will have a clear road and the success secured in the newly restored trade with great Russia.

Reorganized Newark Company

An important reorganization has been effected in Slocum, Avram & Slocum Laboratories, Inc. This reorganization is the result of a complete change in the management of the company which took place January 1, 1920.

This company has recently taken over the manufacture of all Flexite products heretofore produced by F. R. Blair & Co., Inc., including universal joints, propeller shafts and flexible magneto couplings, as well as the sale of these items. The Flexite universal is of the fabric type, and on account of its simplicity and durability has been adopted by many of the most prominent manufacturers in the automobile and truck industries. The manufacturing plant is located in Newark, N. J., and the executive offices in the Woolworth Building, New York.



"Time Is Money"

AN old saying, but, since the dealer is constantly in contact with truck owners who insist that their trucks shall run exactly on schedule, this old saying now has a specific meaning.

The time (and money) saved by Fisk Truck Tires is a constant source of sales. The truck owner who uses Fisk Solid Tires or Fisk Pneumatic Truck Tires gets a mileage and a shock-protection from them which make him "boost" Fisk Truck Tires for you everywhere. Investigate the Fisk line—you will find that Fisk holds old friends and constantly makes new customers.



Next time—BUY FISK

The Fisk Ideal is: "To be the best concern in the world to work for, and the squarest concern in existence to do business with".

FISK TRUCK TIRES

Motor Transport Corps Specifications, Spark Plugs for Truck and Passenger Car Engines

THE following specifications have been adopted as standard by the Motor Transport Corps, U. S. Army, and any commercial spark plug, in order to be purchased for the use of the Motor Transport Corps, must first have been tested under these specifications, found satisfactory and placed on the approved list for purchase. Any commercial concerns desiring War Department business on spark plugs for truck or passenger car engines should submit at once samples of their plugs for test, as specified in paragraph 1 (f) of the specifications. Samples should be sent to the Engineering Branch, Motor Transport Corps, 7th & B Sts., Washington, D. C.

1.—General:

(a) This specification covers the type of spark plugs used in engines of motor trucks and automobile passenger cars.

(b) Plugs shall preferably be two-piece construction. Plugs with other than conventional shaped spark point terminals must be submitted to the Motor Transport Corps for approval of each type.

(c) To be approved for purchase a type of spark plug must conform to the specifications and test described below; and must also have been found to give satisfactory service for at least 100 hours total running time on road or dynamometer test, at the discretion of the Motor Transport Corps, and on an engine of a type to be specified by the Motor Transport Corps. The running test shall include: (1) idling, (2) light load, (3) average load, (4) full load.

(d) Test of spark plugs shall be conducted at the option of the Motor Transport Corps.

(e) The laboratory tests shall be made either at the Bureau of Standards, Washington, D. C., or by any other recognized authority to be designated by the Motor Transport Corps.

(f) The tests described below shall be made on each new type of spark plug submitted for approval, and also on plugs of approved types at such other times as may be desired by the Motor Transport Corps, in order to insure the maintenance of the quality of the plugs delivered. In either case, ten (10) plugs shall be submitted for engine tests, and ten (10) plugs and ten (10) insulators without shells or electrodes for laboratory tests.

(g) In cases where the plugs contain types of insulator which have been already approved, the tests on the bare insulator may be waived at the discretion of the Motor Transport Corps.

2.—Construction and Dimensions:

(a) The threaded portion of the plug shall conform to the S. A. E. standard dimensions for ⅞-in. and metric spark plug threads, and of the A. M. E. for ½-in. pipe thread, to within their respective tolerances.

(b) The gap between the electrodes shall be between 0.5 mm. and 0.7 mm. (0.020 in. and 0.028 in.), and the design and construction shall be such as, in the judgment of the inspector, to maintain this spacing under all conditions of use.

(c) Terminals with 8-32 threads shall be of the screw and nut construction, and the nut shall be adapted to take either eyelet or split spade terminal.

3.—Tests:

(a) **Dielectric Strength.** Three of the sample insulators shall withstand for two minutes without puncture and effective alternating voltage of 25,000 volts applied between the central electrode and a metal band around the outside of the insulator. This test is to be made while the insulator is immersed in oil at room temperature. The passage of a spark over the surface of the insulator shall not be counted a failure unless it occurs at less than 20,000 volts.

(b) **Resistance to Mechanical Vibration.** Two of the assembled plugs shall be tested in the manner described below and shall show no cracks or other signs of mechanical damage after 25,000 blows. The plugs are screwed firmly into the sides of a steel block 6 x 6 x 9 cm. (2.36 in. x 2.36 in. x 3.54 in.), which is carried on the end of an arm 24 cm. (9.44 in.) long. By means of a pair of cams the block is raised 19 mm. (7.4 in.) and allowed to fall upon a hardened steel rail. A pair of tension springs assist in pulling the block downward and give it a velocity of about 200 cm. (78.74 in.) per sec. at the instant of impact.

(c) **Resistance to Thermal Cracking.** Five insulators with shell and central electrode removed shall be brought to a uniform temperature of 150 deg. cent. and then quenched in water at room temperature and examined for cracks by soaking for several hours in an alcoholic solution of eosin.

After the aforesaid quenching and soaking no cracks shall be visible to the naked eye. This test shall not apply to mica plugs.

(d) **Gas Tightness.** Six of the completed plugs shall be screwed into a pressure bomb containing air at a pressure of 15 kg. per sq. cm. (225 lb. per sq. in.) and immersed in a bath of oil heated to 150 deg. cent. Under these conditions the average volume of air leaking through the plugs shall not exceed 1 cc. (.06 cu. in.) per sec., and that through the worst plug shall not exceed 2 cc. (.12 cu. in.) per sec. This test shall be made both before and after the engine test.

Steinmetz to Make Light Delivery Car

NEW YORK CITY.—The long-awaited Steinmetz electric is about to make its appearance. It is the product of the ingenuity of Dr. Charles P. Steinmetz, the electrical wizard and chief consulting engineer of the General Electrical Company, Schenectady, N. Y. A number of years ago, in speaking at a banquet, Mr. Steinmetz claimed that an electrical vehicle, properly constructed, could compete with a gasoline truck.

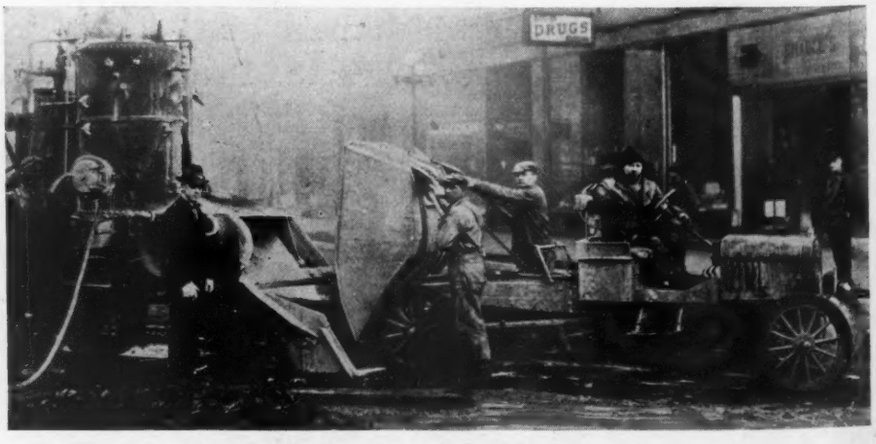
The new car, which will be for light delivery and industrial use, is looked upon as Mr. Steinmetz's solution of the problem. He has eliminated excessive weight, reduced operating cost, and increased the operating radius and carrying capacity.

The car will be manufactured by the Steinmetz Motor Car Corp., which will have its executive offices in the Ziegler Building, 512 Fifth Avenue, New York City. Officers of the corporation include A. Robert Elmore, president; J. P. Story, Jr., vice-president and treasurer, and Nelson H. Truett, secretary.

Denby Directors Elect New Officers

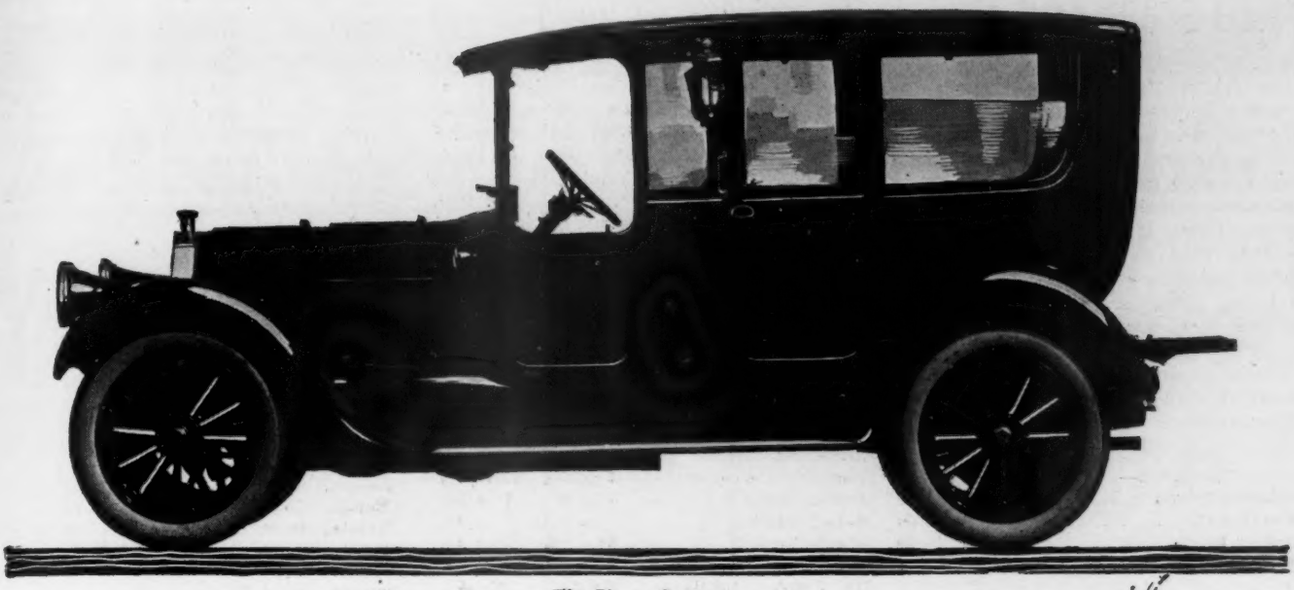
The new directors which were named at the annual stockholders' meeting of the Denby Motor Truck Co., Detroit, Mich., held at the company's offices, February 16, elected the following officers at the close of the meeting: A. S. More, president and general manager; Major Edwin Denby, first vice-president; T. M. Simpson, second vice-president; M. H. O'Brien, secretary; E. R. Ailes, treasurer, and H. T. Carpenter, assistant secretary and treasurer.

Motor Wheel Corporation, Lansing, Mich., has announced its formation as a result of the consolidation of several firms for the purpose of increasing production. The S. Gier Pressed Steel Co., the Prudden Co. and the Auto Wheel Co., all of Lansing, are merged with the Weis & Lesh Manufacturing Co., which has sole plants in Memphis and Jackson, Tenn.



Lee Loader Short Haul Dump Body Owned by Des Moines Asphalt Paving Company, Discharging a Load of Material Into Scoop of Concrete Mixer

The actual time of dumping the load is practically instantaneous even with sticky materials such as concrete and asphalt, due to a seventy-five degree dumping angle. The body is operated from the seat of the truck with one automatic lock.

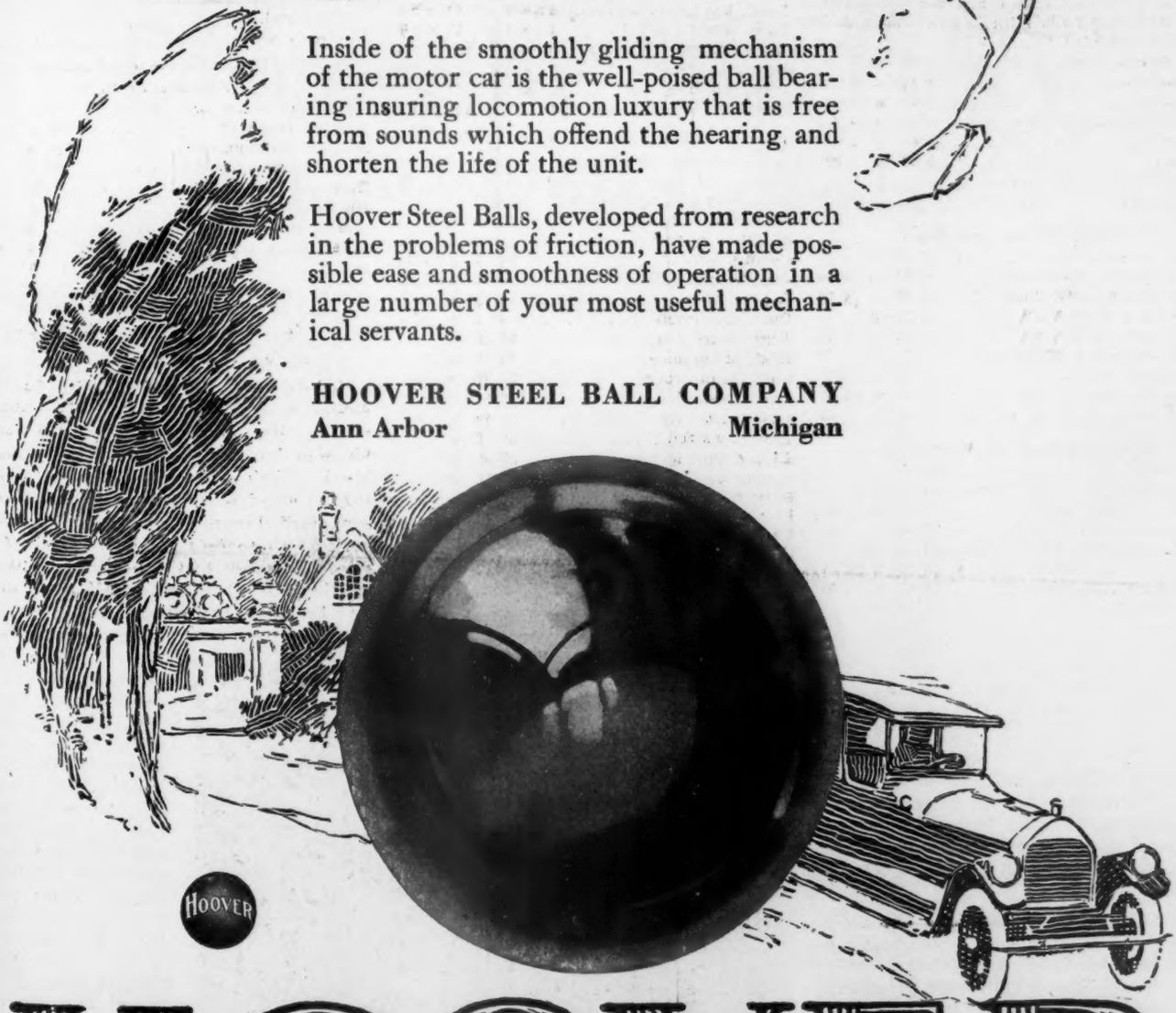


The Pierce-Arrow

Inside of the smoothly gliding mechanism of the motor car is the well-poised ball bearing insuring locomotion luxury that is free from sounds which offend the hearing and shorten the life of the unit.

Hoover Steel Balls, developed from research in the problems of friction, have made possible ease and smoothness of operation in a large number of your most useful mechanical servants.

HOOVER STEEL BALL COMPANY
Ann Arbor **Michigan**



HOOVER
STEEL BALLS

Metal and Rubber Prices

Deliveries Still Slow

The reports from all steel producing centers coincide in regard to their inability to meet the current requirements with promptness. The industry is not alone suffering for lack of transportation, but also from the scarcity of fuel and raw materials. Mills are, therefore, compelled to turn down many projects involving substantial tonnages. In fact, the larger producers are pressed to the point where allotments are necessary. At the present time more attention is directed to the deliveries urgently needed on current contracts rather than the placing of new business.

Steel Products Prices

Per ton—Pittsburgh—			
Bessemer billets	$58 00	a	65 00
Open hearth	58 00	a	65 00
Forging billets	75 00	a	80 00
Sheet bars	60 00	a	.....

Sheets

The following prices are for 100-bundle lots and over f.o.b. mill:

Blue Annealed Sheets—			
Pittsburgh (base)	$4 50	a	5 50
Philadelphia	4 275	a	5 725
Chicago	3 82	a	5 02
Galavanized Sheets of Black Sheet Gauge—			
Pittsburgh	$6 00	a	8 00
Chicago	5 97	a	6 97
Tin—Mill Black Plate—			
Pittsburgh	4 35	a	4 85

Finished Iron and Steel

Steel hoops	$3 05	a	4 25
Tank plates, Pittsburgh	3 50	a	4 00
Tank plates, New York	3 77	a	4 77
Steel bars, New York	3 27	a	....
Steel bars, Pittsburgh	3 00	a	4 00
Rails—Standard Bessemer sections, mill	45 00	a	55 00
Standard, open hearth, mill	47 00	a	57 00
Light sections—25 & 45 lbs.	3 00	a	3 50

Iron and Steel at Pittsburgh

Bessemer iron	$43 40	a	....
Bessemer steel, f.o.b. Pitts.	58 00	a	....
Skelp, grooved, steel	2 45	a	3 60
Skelp, sheared, steel	2 65	a	3 60
Ferromanganese (80 per cent.)	160 00	a	175 00
Steel, melting scrap	25 00	a	26 00
Steel bars	3 50	a	4 75
Wire rods	52 00	a	65 00
Iron bars	4 25	a	4 50
Plain wire	3 00	a	3 50
Plain wire, galvanized	3 70	a	4 20
Cut nails, nominal	5	19½a	....
Wire nails, Pittsburgh	3 25	a	4 50
Steel hoops	3 75	a	4 25
Chain rods	65 00	a	70 00

ALUMINUM.—The position of aluminum continues steady at current prices. Virgin metal in ingots, 98 to 99 per cent., is quoted at $31.50 and $32.50, remelt at $31 and $32, and No. 12 remelt at $29 and $30.

ANTIMONY.—Demand for antimony has quieted down and business yesterday was again confined to a few relatively small lots. The price continues steady at 11⅞ cents for wholesale and 12⅛ cents for retail lots.

GRAPHITE.—Export demand remains quiet and the market is easy. The price of Mexican crude ore is now quoted at $32.60 per ton, New York; Korean at 3⅜ cents per lb., Ceylon at 4⅞ cents per lb. and Madagascar at 9½ cents per lb.

TUNGSTEN.—The market continues quiet, and will remain so until the tariff question is settled. Prices are without quotable change. Chinese Wolframite at $6.25 and $6.50; Bolivian at $9 and $9.50, and American Scheelite at $15 per unit.

OLD METALS.—Aluminum scrap is in good demand at unchanged prices. Copper is quiet but steady. There is a good demand from consumers for No. 1 machinery composition at 17¾ cents delivered. Lead continues firm. Block tin scrap is scarce and active.

Aluminum—	Buying.	Selling.
Cast scrap	23½a24½	26¾a27
Sheet scrap	23 a23¾	25½a26
Clippings	26¼a27½	29½a30
Copper—		
Heavy machinery comp.	15¼a15½	17¼a17¾
Heavy and wire	13½a14¾	15¾a16¼
Light and bottoms	12¼a12½	13¾a14¼
Heavy cut and crucible.	15½a15¾	17½a17¾
Brass, heavy	7¼a 8	9 a 9½
Brass, casting	10¼a10½	11 a12
Brass, light	5⅝a 6⅝	7½a 8½
No. 1 clean brass turn'gs.	7⅞a 8	8¾a10¼
No. 7 comp. turnings	11½a11¾	a13¾a14
Tea lead	4⅞a 5	5¼a 5½
Lead, heavy	6¾a 7	7½a 7¾
Zinc, scrap	4¼a 4½	5 a 5½
Solder joints	10 a10½	11½a12½
New zinc clippings	5¼a 5½	6 a 6½
Pewter dishes	41 a43	45 a47
Block tin, scrap	55 a56	58 a60

Other Metal Products

Following are the prices current for brass and bronze products:

Copper sheets, not rolled	29 50	a	....
Copper bottoms	38 00	a	....
Seamless tubing, bronze	34 50	a	....
Copper rods	26 75	a	27 50
Copper wire	22 25	a	....
Cut lead sheets	12 00	a	....
High brass wire	25 25	a	....
High brass sheets	25 25	a	....
High brass rods	23 75	a	....
Low brass sheets	27 25	a	....
Low brass wire	27 25	a	....
Low brass rods	28 00	a	....
Brazed tubing, brass	37 00	a	....
Brazed tubing, bronze	41 75	a	....
Brazed tubing, copper	41 75	a	....
Seamless high brass tubing	30 50	a	....
Seamless low brass tubing	33 00	a	....
Sheet zinc	12 50	a	....

Plantation Rubber More Active

The exchanging of considerable amounts of rubber has been reported to make plantation rubber easier and lower in all positions. The market has been more active lately than for a long time. A general decline of 1 cent a lb. has been noted all the way around. Paras and Centrals remained dull and nominal.

Para—Up-river, fine	42½a	..	
Up-river, coarse	31½a	..	
Island, fine	42 a	..	
Island, coarse	20½a	..	
Caucho, ball, upper	31½a	32	
Caucho, ball, lower	28½a	..	
Cameta	21½a	..	
Plantation—First latex crepe	45¼a	..	
Brown crepe, thin, clean	41 a	..	
Rolled, brown, crepe	45 a	..	
Smoked ribbed sheets	45 a	..	
Centrals—Corinto	32 a	..	
Esmeralda	32 a	..	
Guayule, wet	25 a	27	
Guayule, washed and dried	.. a	..	
Balata, block, Ciudad	76 a	78	
Balata, block, Colombian	48 a	52	
Balata, block, Panama	46 a	..	
Balata, sheet	*1 00 a	..	
Mexican—Scrap	30 a	..	
Slab	.. a	..	

* Nominal.

SCRAP RUBBER.—Demand continues light, but in the absence of selling pressure prices are steady.

Boots and shoes	8⅜a	..	
Arctics, trimmed	6 a	..	
Arctics, untrimmed	5 a	..	
Tires—Automobile	3¼a	..	
Bicycles, pneumatic	2½a	..	
Hose, steam, fire	1 a	1¾	
Inner tubes, No. 1	.. a	14½	
Inner tubes, No. 2	.. a	9	

Baker Delivery Adopts Unique Step Assembly

A new feature recently patented and added to the front drive Ward Special chassis manufactured by the Ward Vehicle Co., Mt. Vernon, N. Y., is the combination bumper, step and dash assembly in which a broad, iron-bound, oval-shaped wood bumper is so mounted and supported forward of the front goose neck as to serve also the purpose of a step. Entrance to the vehicle is obtained through a swinging half dash that may be bolted or locked in either a driving or operating and working position. When driving to the route, the dash extends across the entire front of the vehicle. Upon reaching the route, the bolt is withdrawn and the dash swung about its vertically hinged center line to a point 180 deg. from the full-dash position. In this new position it is locked by means of the same bolt so that entrance and exit is easily obtained by means of this half dash opening in combination with the bumper step.



Front Step Arrangement on Bakers' Delivery Car

The Resiliency is Built in the Wheel

You Motor Truck Distributors

Who Are Not Acquainted With Our

Co-operative Sales Policy

Should Write Us Today



Are you aware that SEWELL CUSHION WHEELS can be applied to the trucks that you sell without *changing* their design or construction?

Address Correspondence Attention Truck Dealers' Division

Sewell Cushion Wheel Co. Detroit, Mich.

Solving Rigging and Hauling Problems With Motorized Equipment

By K. HERRICK

THOMAS J. THOMPSON, Phila., Pa., hauling contractor, specializing in rigging and hoisting, found, after dispensing of the last of his twenty head of horses, some eight months ago, replacing them with a motorized equipment, consisting of five 5-ton Pierce-Arrow trucks and four trailers, that he was accomplishing far more for his business with the fleet than he ever did with the horse-drawn vehicles.

Thompson occupies a strategic position in the heart of the wholesale district, where there is a constant transportation of the heavy types of machinery in the moving of which he is expert. He confines his work within a fifty-mile radius, for the most part, leaving the city only on a customer's special order. In fact his solicitations, which does not include intercity hauling on schedule, extends only to local work.

Complete With Wrecking Paraphernalia

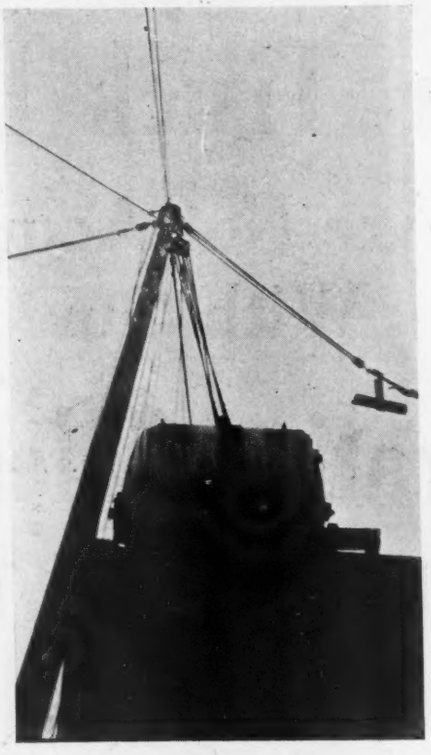
His trucks, all high-platform stake bodies with cab, attractively painted and conspicuously lettered, are of the open type specially constructed and fitted for his trade. Two are equipped with vertical capstan power winches, while a third has a demountable power winch apparatus. It can be dismantled or assembled in a remarkably short time. He considers the vertical capstan more suited to his line than the horizontal, as it is more practical for the hoisting of long material, such as poles and piping, which represents the majority of his work.

"The vertical capstan winch will take about a mile of rope without trouble," says Thompson, "and I find it particularly convenient in my line, which includes general wrecking of big plants, jacking up bridges and raising stacks, boilers and condensers."

The trailers, one of which is used at a time with a truck, range from twenty-five to fifty tons' capacity each. They are of the old "catamaran" type, having notably heavy wheels and equipped with a pole-hitch. When the trailer fleet, which formerly was horse-drawn, was on the road fully loaded, it meant the use of from thirty to forty horses.

Equipment taken along with the trucks on a job, consists of jacks, rollers, cribbing, bars, block-and-fall devices, chain blocks and towing chains, while only a driver and one helper ordinarily go on the smaller jobs for each truck. Big crews are used for the heavier kinds of work, especially where the trailers are employed.

When, big boilers, or heavy castings are being transported, they will be loaded on truck and trailer, with an adequate gang to handle them, no matter how many men it may require. Keeping in touch with labor and motor trucking firms which he can employ in cases of emergency to send additional men or auxiliary trucks, is part of Thompson's business. He may get a rush order to move heavy machinery and this requires the facility for assembling gangs on short notice.



"Tall Stuff" in Rigging

In which a hundred foot pole is used in lifting to the top of the Abbott Building the three hundred gallon porcelain-lined steel milk-tank.

At one time Thompson was engaged in junk business as a side-line, but as it did not pay in connection with his other work, he gave it up, using the warehouse formerly devoted to that purpose, for housing his huge trailers, hoisting paraphernalia,, and poles. The garage Thompson patronizes is but two blocks from his office.

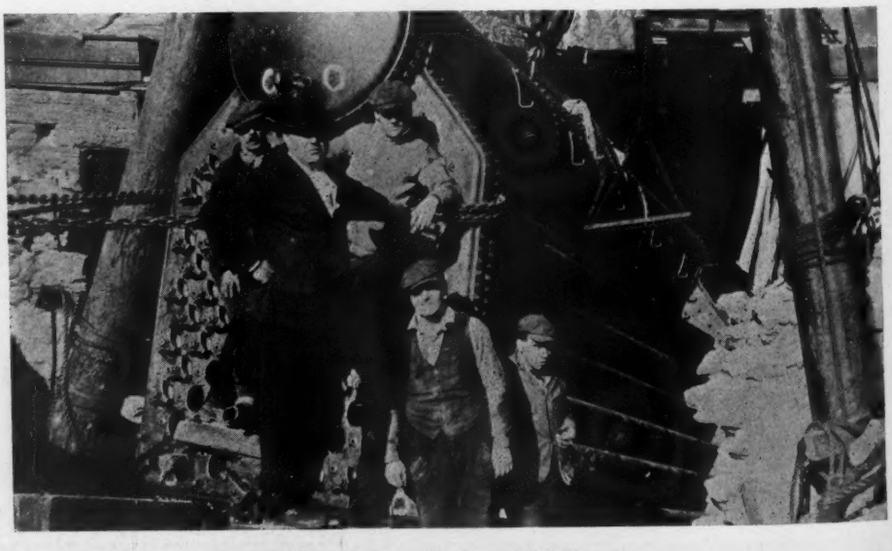
An estimated operating cost, per truck, of $14 a day, which includes all the usual items of fixed and mileage charges, is the basis of all of Thompson's computations. Depreciation at 20 per cent. a year on each vehicle and an average of three and a half miles per gal. of gasoline, constitute the chief running expenses. He has found he uses oil at the rate of 250 mi. to the qt. One barrel of grease for the five trucks and the four trailers lasts him a year.

His oldest truck is three years old and it has not been necessary to paint any of them in that time. They are kept clean and look remarkably well, to the extent that they are a showy advertisement for the business. Whenever any minor repairs are needed, the drivers make them, but where any heavy repair is necessary the Pierce-Arrow service station is called on to perform the work.

Trailers Withstand Heavy Usage

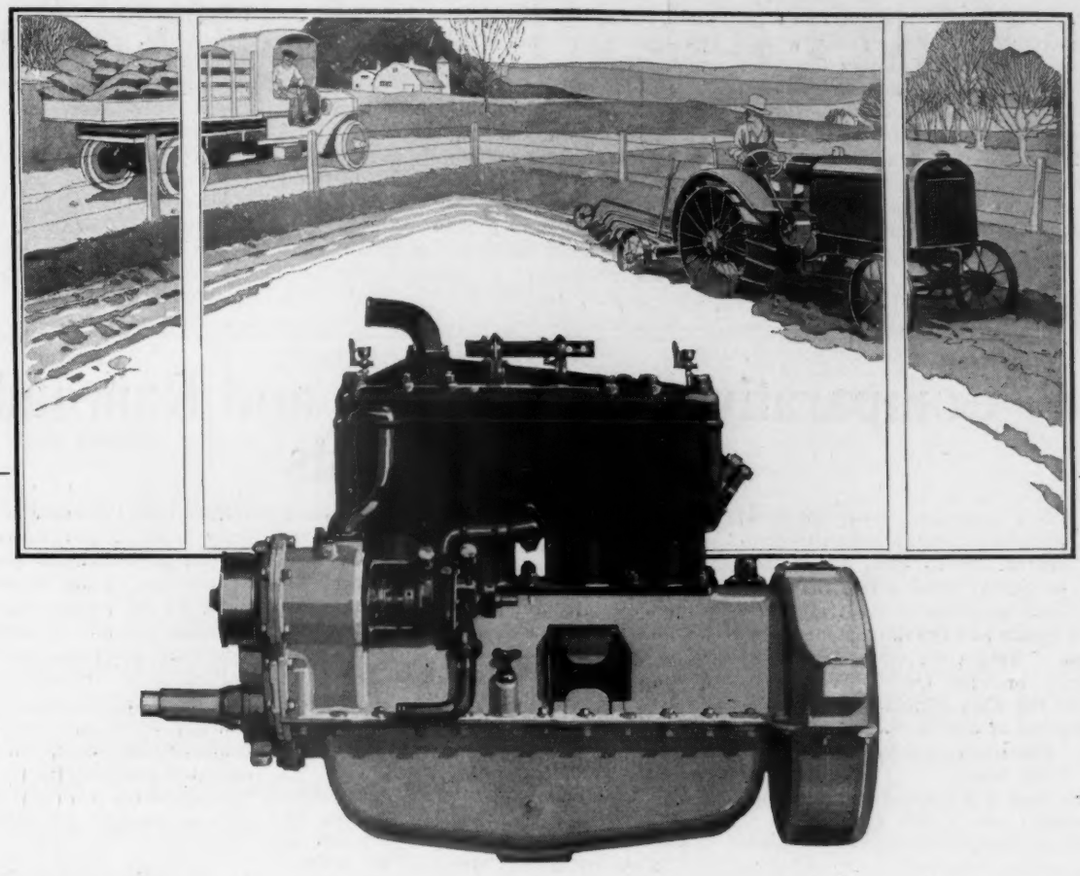
The experience which Thompson has had with his adapted trailers is different from the usual one, in that, used as appendages to motor equipment, although originally horse-drawn, they have not proved frail.

This is accountable, in a measure, by the fact of their heavy and compact type. That the ordinary "horse trucks" will not stand up well under trailer usage, is accepted as axiomatic by most experienced hauling concerns. This is not significant of inherent weakness in the trailer, in-



They Had a "Ripping Old Time"

The Thompson crew tearing out a thirty-five ton boiler to haul by truck and trailer for miles from the scene of wreckage



The latest Buda engine features will be on view at the Boston Motor Truck Show, Space E-420. A really cordial welcome awaits you at the Buda booth

For the better American trucks, the Buda engine is providing a mechanical excellence and positive performance that effectively harmonizes with their fidelity of construction.

Symmetrical in design, and meeting fully the diversity of truck power requirements, the new series of eight Buda engines has a bore and stroke ranging from 3⅜ x 5¼ to 5 x 6½ inches.

To provide proper power for solid or pneumatic tire service with the same truck base, manufacturers may select from this series two Buda engines having the same mounting dimensions but sufficiently different in rating.

The pronounced selling ease of Buda-equipped trucks that the many manufacturers and dealers now value will from year to year be intensified by the distinctive and wide-reaching Buda advertising program now in effect.

THE BUDA COMPANY, *Harvey* (CHICAGO SUBURB), *Ill.*

ESTABLISHED 1881

BUDA

The

ENGINE

naturally, disappeared. The massive quality and construction of the trailers' wheels have prevented troubles in this direction, despite the heavy loads and the not infrequent rough going over cobblestones. The axles match the wheels in ruggedness and, as they are kept well lubricated, do not break.

The quality of work performed by the Thompson outfit may be readily conceived from the following completed contracts:

Hauled thirty-ton boiler from Chestnut Hill, Philadelphia suburban district, to St. Joseph's Convent, upgrade for four miles, using truck and trailer, after tearing boiler out of building.

Hauled four thirty-five-ton boilers from Holmesburg, an outlying town of Philadelphia, to a farm pumping station, a distance of several miles, in which a fifty-ton trailer was utilized.

Raised 300-gal. porcelain-lined, steel storage tank for milk, to top of Alderney Dairies Building. A hundred-foot pole was used in rigging this job, the tank being carefully steered, tackled through a heavy belt, to the summit of the building, where it now rests, surmounted by a protecting shed. To this reservoir is pumped the milk for reserve, from the first floor where it is received.

Thompson believes in the power of advertising—not only by keeping his brightly-painted trucks, displaying his name, business and address, in good running order, but also by keeping a small standing display advertisement in the daily papers.

Comparative Motor Truck and Railroad Freighting Costs

MANY concrete comparisons, gathered through exhaustive research, as to cost, range and service of moving less than carload shipments via freight to short haul points and the movement of the same class of freight via motor truck was impressively brought out by W. J. L. Banham of the Otis Elevator Co., in address delivered at one the sessions of the Highway Transport Conference during the New York Show.

The following is a resume of the salient points brought out in this address.

The actual transportation cost includes all the expenses involved in making a shipment, starting with the boxing or packing expense, together with handling expense in the shipping department, the loading of freight on teams for delivery to the freight house, teaming charges from the shipping department to the local freight house, and additional labor incidental thereto, less than carload freight rate and cost of cartage at the delivery point. In addition to this, such other expenses that may be caused by requests for tracing, duplication of shipments, lost or damaged in transit, entering of claims, checking of freight bills, and delay to shipments in transit, should be given consideration in the final cost figures.

It has been found that the same shipment via truck eliminates many of the cost items incident to freight movement. Figures were worked out on an average basis, while substantially correct, they may not be applicable due to local conditions existing in every shipping department.

In practically every instance, it is necessary to prepare material for freight shipment in an entirely different way than if it moved via motor truck direct from the shipper to the received. It is necessary to go to considerable additional expense for boxing or crating in order to protect the shipment.

Included in the freight cost is the first class rate plus 30 cents per hund. lb. teaming charges at shipping and receiving point. To these costs is added 17 per cent. for the cost of carrying the increased weight caused by heavy boxing, and 24 cents per hund. lb. for thhe increased cost of boxing. The rate via motor truck, covers delivery from the shipper's warehouse to the receiver's warehouse. On this basis an average rate was founded, which is believed to be a fair one to use in comparison with the freight cost movement.

The rates worked out are based on shipments moving from Newark to Yonkers. To make a less than carload shipment via freight has been found to average a dollar per hund. lb. The same movement with decreased boxing, decreased weight, and decreased labor, averages $.20; a saving of $.20 per hund. lb., in favor of the motor truck.

Taking New York, the average rate, combining the same costs, is $.88, as against the motor truck, $.15; Passaic it is $.88 against $.15; Paterson $.88, against $.18; Trenton $.88, against $.55; Philadelphia $.98, against $.75; Bridgeport, Connecticut, $1.12, as against $.75; New Haven, $1.12, against $.85; in Providence, the combination freight rate is $1.21, against $1.15; Port Jefferson, Long Island, $.96, against the motor rate of $.75; Asbury Park, New Jersey $.94, against $.45.

One of the greatest savings made possible by motor truck transportation is the conservation of lumber and other material used for packing, together with additional labor and other charges incidental thereto.

Other points that should be taken into consideration is the amount of material in transit which is not producing revenue, either for the shipper or receiver, while it is in the hands of the carriers. The amount of space used in the shipping department in order to prepare shipments to move via freight. How much less space is required in the shipping department if the amount of boxing and packing used on shipments is materially reduced. The amount of lumber it is necessary to carry in stock for boxing, the space necessary to store it, and the amount of freight charges paid on wet lumber, if it is stocked in the open. The amount of material and money tied up, because no one knows definitely how long it will take to deliver by freight between factory and customer.

Any comparison between railroad movement and motor truck movement is entirely in favor of the motor truck, as it is necessary for the motor truck operators to make delivery in the shortest possible time, in order to operate their equipment financially successfully. It is rather difficult to state definitely as to the range that a motor truck can compete successfully with a rail movement. What is needed at the present time is organization on the part of the motor truck operators, in order to secure heavier loading and eliminate, as far as possible, motor trucks returning without a full load.

In general, if manufacturers will take into account all the various costs and charges which are part of a true freight transportation cost, motor trucks can be operated successfully in competition with the common carriers for distances of between 10 and 125 miles.

Railroads Find Motor Truck Profitable for Short Hauls in Switching Service

As a real adjunct to the railroad, not only in inter-city haulage, but handling materials of the railroad for short hauls, the motor truck will prove indispensable, M. L. Pulcher, vice-president of the Federal Motor Truck Co., Detroit, Mich., who has had many years experience in the traffic department of one of the leading railroads of the country, believes that the motor truck used as an adjunct in the terminal switching service of railroads will help offset the inadequate terminal switching facilities throughout the country.

"It is the present practice of the railroads to handle company material and stores at division points in switching service," he declared. "Where trucks have been employed by the railroads a great operating service has been accomplished and this has also released their own motive power, tracks and equipment for the handling of carload traffic which must, of course, be handled by the present methods.

"Trucks could also be very properly used where trap car service is given. There is a very large amount of less than carload merchandise switched between sub-stations and transfer houses which could be handled to much better advantage by trucks. The present operating cost of a locomotive in switching service is probably in the neighborhood of from $75 to $100 a day. The daily operating cost of a truck is from $12 to $20 a day, including maintenance and all other items entering into operating costs."

Shouldering Your Design Problems

THERE are 2000 odd places in a car's design that the Chief Engineer has to watch in his effort to maintain the pre-war quality in the face of today's labor, material and production difficulties.

There are 20 odd of those parts—the car's BEARINGS—in which SKF can take the task of insuring quality from his mind.

Partly by having a product that stands without a rival in the bearing industry.

Partly by having a research staff of experienced engineers, specializing on bearings, who can sit in with the automotive manufacturer's engineering staff, hear the problems, read the blueprints, and throw into the solution of the problems the entire resources of a scientific institution that does nothing but study the proper design and application of bearings.

Manufacturers are invited to avail themselves of this freely offered co-operation

S K F INDUSTRIES, INCORPORATED
Sales, Service and Research Division
165 Broadway, New York City

(582)

SKF INDUSTRIES

Hess-Bright Ball Bearings
S K F Ball Bearings
Atlas Steel Balls
Gronkvist Chucks
Transmission Hangers



S K F Research Laboratories where friction problems are solved.

The Value of Highway Transport Surveys

(*Continued from page 30*)

highway transport in the form of motor buses can very greatly relieve this situation.

In a recent issue of the "Electric Railway Journal," an authority on the electric railway industry, the assistant to the president of the railway company in one of our large cities, in discussing how buses are run in that city in connection with the railway, makes the following statement:

> "It is believed the motor bus is here to stay, that its use is going to increase largely and that the logical people to handle and develop it are those who have been trained and received their experience in street railway operation. It behooves the progressive street railway manager to study the motor bus situation and be prepared to meet it and to use it as an auxiliary to his other operations, rather than have to fight it as a competitor."

The buses in the city of Newark, N. J., a city of 400,000 people, carried 16,000,000 passengers the first half of last year and statistics from several other cities indicate that the bus surely is here to stay.

Yet many operations of this kind have been inaugurated and have failed, or are not operating to the best advantage of the general public. The proper kind of survey will, in most instances, save such failures and cause the successful operators to give even better service and be more efficient and point the way to where new operations are desirable and how to successfully inaugurate them.

No general survey of the field of highway transport would be comp'ete that left out of account its use in districts now without rail facilities. Mines, forests and quarries situated in remote sections are generally exploited by big organizations with financial backing sufficient to solve their own transportation problems, and many of them are finding their solution in the use of the motor truck.

Necessity for Survey in Farming Sections

In the farming sections, however, where the productive unit is comparatively small, there has not been the same incentive for big business to make a thorough survey of conditions and here is a tremendous field of opportunity.

The same factors that affect the big manufacturing institutions in the industrial centers—rising costs, labor shortage and lack of adequate transportation facilities—affect equally the producers in the fields. The situation is serious and at any time may become acute. Every help that can be given to the producer of foodstuffs adds to the well-being of the nation.

Some one in authority has said that if the labor situation on the farms is not relieved in some manner that in a short time, for a certain period, some of those in commercial and industrial life, will have to assist the farmer in harvesting his crops if we are to obtain a sufficient amount of farm products. One answer to this, and probably the most logical one, is to so arrange the farmers' transportation that it will be unnecessary for him to take labor from his farm to perform this function, as heretofore, and a proper use of the motor truck and the highway will go a long way toward meeting this problem.

Our present system of food distribution is probably the most expensive the world has ever known. That the motor truck can reduce such costs has been proven absolutely by the Government, itself. The savings effected by Assistant Postmaster Blakeslee in his actual demonstration of highway transport lines from some of the rural districts in Pennsylvania to Philadelphia and Washington are significant, to say the least. On an exhibit recently shown the Committee on Post Roads and Postal Service, of the House of Representatives, by Mr. Blakeslee of forty-one trips made by the Motor Vehicle Truck Routes, a saving of $6612 to the consumer was the result. Added to this was the time saved to the farmers who had their produce taken from their gate to the market and who were thus enabled to continue performing actual work on their

We have traveled far in considering transportation surveys in connection with farm and forest, mine and quarry, steam and electric railways, and will close our inquiry by getting right down to cases and see what a survey can do for the individual business.

Delivery Cost Just as Important as Manufacturing Cost

The hauling and delivery problem of every business should be surveyed in order that the most efficient means of transportation can be used, particularly in reference to the highways. It is astonishing how little most concerns know about the cost of the delivery and hauling end of their business. The concern that usually knows its labor, production, accounting and selling costs, many times has no idea of its delivery cost. A survey of such a problem will often indicate that it would be more economical to deliver by motor truck than by horse-drawn vehicles, or by the common carriers. In considering a transportation system the nature and character of the business it serves should be considered first.

The proper kind of a survey will bring out all the items entering into the cost which would never be brought out in any other way. For instance, I had occasion recently to make a survey of the shipping part of a business concerned with the rolling of steel products. This was a large concern with a railroad siding right into its plant. Its products take a very low freight rate and its deliveries are mostly to points located within sixty miles of the plant. Yet, this survey showed that the motor truck could be used to better advantage than the railroad, that it could transport material cheaper and exactly as it was wanted.

This survey developed, for example, that the average cost per box used to contain the material was $1.25 and that the average weight of these boxes was 42 lbs., something that the traffic manager of this concern had never considered before in this transport problem. Motor trucks are now being used by this company, thus releasing several freight cars for use where the railroad is the more economical means of transport.

The proper sized truck, the most adaptable kind of body, and the use of loading and unloading devices will many times serve to handle the hauling problem more economically and efficiently.

Such a survey should take us behind the lines, so to speak—back of the loading platform into the shipping room where we could consider such items as boxing, crating, sorting, assembling, routing, internal delivery, etc. It is here that, oftentimes, a study will show how the use of highway transport can cut down the cost of the work leading up to placing the material on the truck or on the car.

In making surveys relative to the establishment of highway freight transport lines, the following items should be carefully considered:

All year round road conditions, including bridges.
Rail freight and express rates.
Frequency of existing service.
Time of delivery of existing service.
Amount of, and kind of, freight moving in both directions between the points in question.
Running time possible.
Sentiment of the district under consideration toward existing and proposed service.
Sufficient financial support.
Traffic Laws, Ordinances and Regulations.

Road conditions will determine the kind of equipment that can be operated. The amount and kind of freight will determine the size of the unit, and number necessary, from which can be determined the expense, to which should be added (this is most often omitted) overhead charges, by which I mean the cost of soliciting business, storing and handling of same, superintendence, etc., and which for such lines runs very high. The cost of operation will determine the rate. This compared with existing rates and services will determine whether or not business can be secured under such costs. The possibility of promoting return loads should not be forgotten. This, you will note, is quite different from the usual method of arbitrarily determining a rate, which is probably that charged in some other locality and without knowledge of actual conditions.

All this information is very easy to get if gone after in the proper way. Most communities now have commercial organizations which will be very glad to assist in the accumulation of such data.

Reliability in such service is absolutely necessary. In the case of highway passenger transport, the number of passengers will determine the seating capacity desired and the frequency of operation, which together with the length of haul will determine operating expenses and, therefore, the fare that must be charged. Here again reliable service must be inaugurated, as reliability is important in all transport matters.

GARFORD



Garfords give *Low Cost Ton-Mile* because they serve economically for long hours *and keep on doing it.*

Garford

Lima, Ohio

A GARFORD FOR EVERY PURPOSE—1¼ TO 6 TON CAPACITY

TRUCKS

Keeping the Truck Owner Posted as to the Condition of His Trucks

By H. R. BRATE

WHEN Donald W. Drennen took over the management of the Birmingham Motor Co., Birmingham, Ala., some four years ago, he had certain ideas of how the truck should be merchandized. He knew the service was the keystone in the arch of the successful truck dealer, but he found that often the owners were not kept advised of the true condition of their trucks after they had been inspected by the service department, which accounted for some trucks being neglected, and, therefore, did not give the satisfaction that they should.

He therefore decided that the Birmingham Motor Co. and service should become synonymous, so that the truck owners of that city would not think of one without the other, and adopted "The House of Sudden Service" as his slogan.

In order that his customers might understand that service started the very day the truck was delivered to them, the morning after the machine is delivered the owner receives the following letter:

Perfection Mattress Co.,
Birmingham, Ala.

Gentlemen:

We take this method of thanking you for the purchase from us of a Federal Truck, No. 18097, Model TE-12-120, which we delivered to you on November 25th.

It now becomes the duty of our Service Manager to take care of the service which goes with this truck—3 hours' inspection each month for one year.

Upon the first few hundred miles service and care of a truck depends its life, and for that reason we are anxious to make any adjustment that seems necessary. You should have fresh oil put in the motor, have it doped, and the grease cups turned up every 500 miles. If this is done religiously, the mileage that your truck will deliver is indefinite.

Should any work be necessary that would require more than the above three hours which is given gratis to you, it will be billed at the customary rate.

Wishing you the best of luck, and when you need another Federal, please do not hesitate to command."

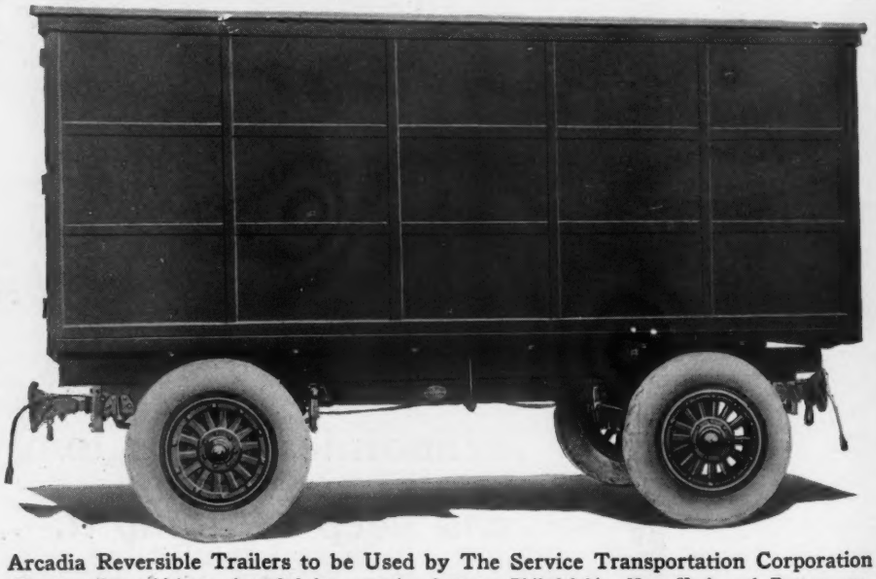
A letter similar to this gives the customer the feeling that Drennen's interest in the truck does not stop the minute the machine is delivered and he has had his pay for it. It also tends to avoid any misunderstanding regarding the amount of service that is to be given gratis.

Condition of Truck Reported to Owner

When the truck is brought in for inspection, it is carefully gone over and a report made out in duplicate by the inspector. The copy on which the condition of every part is noted, is mailed to the owner. If some parts are showing undue wear on account of neglect on the part of the driver, it is so noted. If the inspection reveals the fact that certain parts require more attention than can be given in the "gratis service," the owner is either called on the 'phone or a letter is written, giving an estimate of about what the work will cost. This is done to avoid any misunderstanding when bill is rendered.

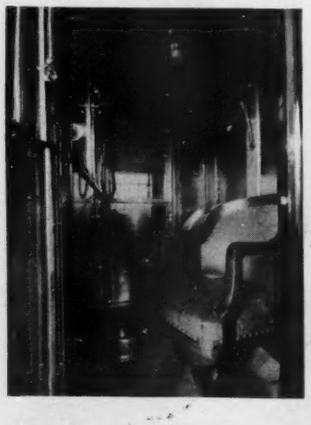
"Before we adopted this method of rendering a report to the owner," said Mr. Drennen, "we often found that just telling the drivers that certain parts should be attended to, did not reach the owners, but now the report goes direct and the trucks are quite certain of receiving the attention they require."

In order to be sure that the truck is in good working order when it goes out from the repair shop, one of the chief testers takes it out and tests it. If found in a satisfactory condition, an "O. K." tag is attached, otherwise it is returned to the shop. The service manager keeps a record of the time the truck is received from the repair shop, the time the tester takes it out and returns, also any comments the tester may make as to its condition. This record is filed for reference.



Arcadia Reversible Trailers to be Used by The Service Transportation Corporation

These trailers which are intended for operation between Philadelphia, New York and Boston, are constructed along the regular 3½ ton Arcadia specifications, except that the frame is 14 feet long and is equipped with 40 x 8 pneumatic tires. These trailers have brakes which incorporate the special Arcadia system of brake connection with the truck driver from the cab.







Bolivia Police Patrol Combination Prison and Office

Probably the most elaborate conveyance of its kind ever built in the United States is this police patrol built by the Garford Motor Truck Company of Lima, Ohio, for the police department in La Paz, Bolivia. It has three compartments, one for the Chief of Police, one for the prisoners and the third for the driver. The special compartment for the Chief of Police is furnished with swivel chairs, upholstered in blue leather, a rich carpet of blue and drapings to match. Every convenience is provided, including an electric cigar lighter, speaking tubes and dome lights. Rings are provided in the back of the seats of the prisoner compartment to which unruly offenders may be handcuffed to make sure that they cannot escape.

MARTIN
CUSHION WHEELS
FOR MOTOR TRUCKS

No Bolts
No Nuts
Pressed on
Throughout
Light
Strong
Resilient
Durable



Backed
by
Nine Years'
Experience
in Building
Good
Cushion
Wheels

Adopted for Standard Equipment on
"OLD RELIABLE" MOTOR TRUCKS
1½ to 7 Ton

MARTIN CUSHION WHEEL CO.
311-13 N. SANGAMON STREET CHICAGO, ILLINOIS
BRANCHES AND SERVICE STATIONS IN ALL PRINCIPAL CITIES
PRICES ON REQUEST

Trailers Used in Hauling 3,200 Pound Tractors

Something that would facilitate the rapid loading and unloading of shipments was the very big problem with which the Bean Spray Pump Co., San Jose, Cal., manufacturers of the Bean tractor, was confronted. As the products of this company are loaded from the curb opposite its place of business in a thoroughfare that at times becomes extremely congested, a quick system of loading was absolutely essential. This difficulty was remedied recently by the addition of trailers to the company's truck equipment. Although the attaching of the trailer to the truck made movement in the traffic congested street inconvenient, in fact, the truck could not even be brought at right angles to the trailer and was, therefore, compelled to extend across the street car tracks, it does not interfere with the regular passage of street traffic as the operation of loading only required a few minutes.



Two Views of an Outfit Used by a Western Company

The upper illustration shows the tractor perched upon the trailer ready for the trip. Lower illustration shows the simple method of loading trailer.

To prepare the trailer for loading or unloading, it is only necessary to release a chain which holds the platform of the trailer parallel with the ground, letting the rear end of the platform strike the ground. All that is then necessary is to run the tractor which weighs 3,200 lbs. up the incline until the weight of the tractor automatically brings the platform back into its former position. The chain is then refastened The trailers being used by the Bean Spray Co. were bought from the Utilities Trailer Sales Co., Dallas, Tex.

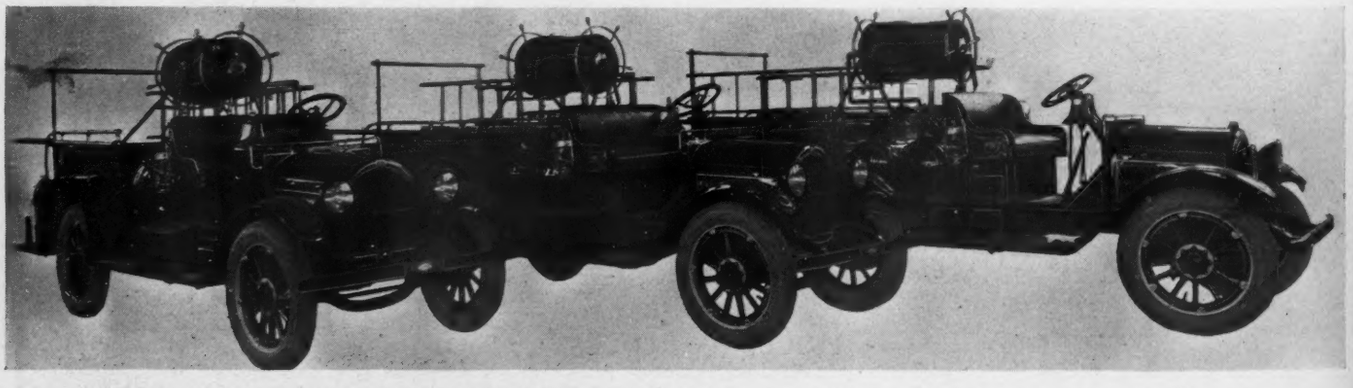
Data on Motor Transport Being Gathered

Grosvenor B. Clarkson, Director of the United States Council of National Defense, by authority of the Secretary of War, wrote to every state governor requesting that he take steps for mobilizing the motor transport resources within his state to the end of using highways transport wherever necessary or advisable in any national emergency. This was in conformity with the Council's policy of utilizing the civilian motor transport resources of the country for emergency purposes, as initiated by its former Highways Transport Committee.

In writing the governors, Mr. Clarkson stated:

"Plans of this character now being considered contemplate the use in the most economical and efficient way possible of motor transport resources, both federal and civilian, the one supplementing the other, but so co-ordinated in their uses as to prevent possible duplication."

There has been a most hearty response received from the governors. Their letters show that in the few instances where complete data is not available, overtures are being made or have been made in the recent past for the compilation of transport information.



Detroit Fire Fighters Use Oldsmobile Economy Truck Equipped With the Necessary Fire Apparatus

The equipment consists of two 35-gallon chemical tanks with 150-foot chemical and water hose and additional 500 feet of standard water hose which is carried on the body

Apex
THE TWIN-FRAME TRUCK

"The High Point of Truck Service"

Its Superior Construction Sells It

Stays Sold Through Performance

A FINELY equipped exclusive truck factory, economically located, and manned by an organization of truck manufacturing experts is behind the APEX.

The 1 ton, the 1½ ton and the 2½ ton jobs are the outstanding truck values of the times.

The twin frame construction is an exclusive APEX feature. This construction, combined with the well-known standardized units listed, gives all APEX models power and endurance beyond the average truck. The APEX has a sustained record of haulage efficiency. It stands up under the hardest service. Operating expense is economical. Unquestionably the APEX selling franchise is one that will bring prestige and profit to dealers.

We will be glad to get in touch with high-class truck merchants in territory where we are not now represented. Correspondence solicited

3 Models

1 ton	1½ ton	2½ ton
$1495	$1695	$2450

HAMILTON MOTORS COMPANY

Grand Haven Michigan

Standardized Units

Motors—Buda.
Transmissions—Fuller.
Carburetors—Stromberg.
Clutches—Fuller.
Front Axles—Drop Forged I-Beam with Timken Bearings.
Springs—Graded Construction Silico Manganese Alloy.
Rear Axles—Torbensen Internal Gear.
Frames—Celebrated Apex Twin-Frame Construction.

Engineering Specifications on Application



The Truck Tire That Makes Lasting Friends



SUPERIOR Service can only mean Superior Quality that holds such firms as John S. Baisden, Inc.

Because of their exceptional wear-resisting quality it is inevitable that Polack Truck Tires should continue to give *year after year satisfaction.*

Years of specialization with one product—the pioneer of all Truck Tires—have established Quality in Polack Truck Tires on a certain scientific basis that assures Truck Users fine service as consistent as it is exceptional.

Dealers can take advantage of the attractive money-making opportunity in selling Polack Truck Tires to the best class of truck users.

The superior performance of Polack Truck Tires in all lines of business assures Dealers a constantly-growing volume and the lasting good-will of their customers.

With a product that is right, a price that is right, and an adjustment basis that is an established fact, not an innovation, the Polack Dealer proposition undoubtedly offers an attractive money-making opportunity.

POLACK TRUCK TIRES

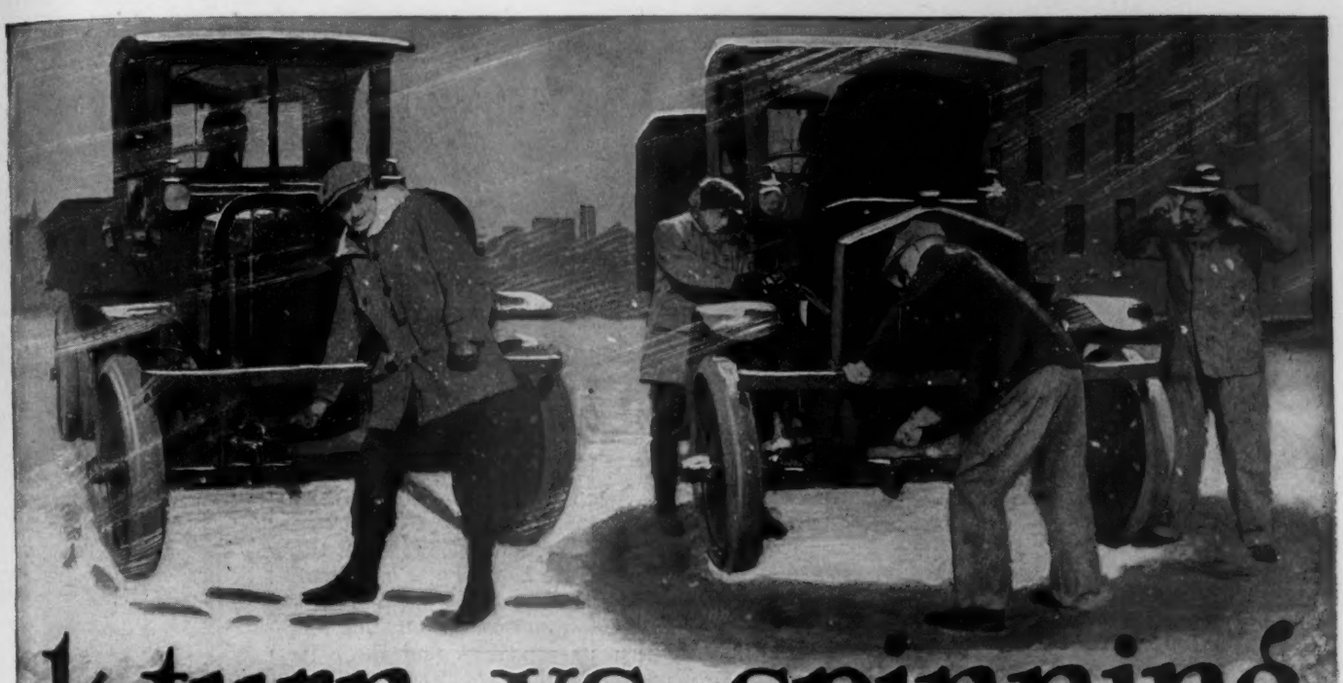
SINCE 1899 WORLD'S STANDARD

—complete in both Regular type and High Crown type.
—enable Dealers to dominate the best and most profitable truck-user business in their territory not only the first year, but every year.

Write for full details of Polack Dealer Proposition in open territory

POLACK TYRE & RUBBER CO.

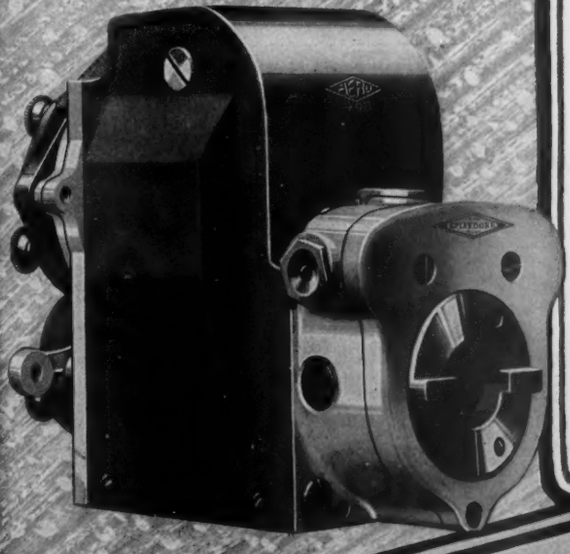
1876 BROADWAY,-- NEW YORK.



¼ turn vs. spinning

Splitdorf "Aero" Magneto with Enclosed Automatic Impulse Starter

Standard equipment on such trucks as Mack, Pierce-Arrow, Garford, etc.



A cold, stiff engine will start easily if equipped with Splitdorf Magneto and Enclosed Automatic Impulse Starter. No back-breaking effort necessary even when the thermometer hovers around zero.

The Impulse Starter is a part of the coupling used in driving the magneto.

A quarter turn of the crank shaft, on compression stroke, releases a spring within this device. The released spring energy twirls the magneto shaft to a speed far in advance of the crank shaft speed, producing an extra hot spark in the charge to be fired. The stiffest engine starts instantly.

The cutting in and cutting out of the Splitdorf Impulse Starter is entirely automatic. When the Impulse Starter is functioning the spark is automatically retarded regardless of spark-lever position, positively eliminating back-firing.

Safe and dependable—always dependable.

SPLITDORF ELECTRICAL COMPANY
Newark, N. J.

TRADE
SPLITDORF
MARK


It Sets the Pace
The Independent is a truly versatile truck. A list of its thousands of users throughout the country reveals its varied applications to all kinds of businesses. It is hauling heavy loads for contractors and packers; it is cutting labor costs for storage concerns and furnishing economical haulage for transportation companies. It is serving public service corporations and private enterprises in the same economical and efficient way. In fact, there seems to be no type of work extant that baffles this remarkable motor truck.
One reason why Independent dealers are firm in their allegiance to the line is because its exploits furnish them each week, each month, with a new chapter in a remarkable document of transportation efficiency. In its ordinary, every-day operation it performs so consistently and functions so smoothly that its exponents find themselves resolving to grow up to its high level.
If you are considering a truck line, we say to you, select a truck that will set the pace. You can't overstate the Independent case, nor can you promise much, outside of impossibilities, that it cannot live up to in its daily operation. Think of representing such a truck locally!
Here are the important specifications that clearly show the quality of Independent construction: Continental motor, Bosch ignition, Fuller transmission, Russel internal gear drive, Stromberg carburetor, and others of similar character. Backed by ten years of truck making experience, the Independent line of 1, 1½ and 2 ton trucks furnish the dealer, alert to a real merchandising opportunity, a real chance for local dominance. Write us!
INDEPENDENT
Motor Truck Company, Inc.
Davenport, Iowa
INDEPENDENT



COVERT EQUIPPED

When you read in the specifications of passenger cars, trucks and tractors that Covert Transmissions form an essential part of the mechanism, you gain a definite impression about the quality of these machines. It means that the makers are satisfied with nothing short of the best.

Trucks

Columbia	Huffman	Pierce-Arrow
Day-Elder	Kelly-Springfield	Standard
Diamond T	Vim	Tiffin
Duplex	Reynolds	Niles
Eagle	Rowe	Buffalo
Indiana	Traffic	American
Hebb	Traylor	

Passenger Cars

Chandler	Meteor	Saxon
Crow-Elkhart	Premier	Singer
	Jackson	

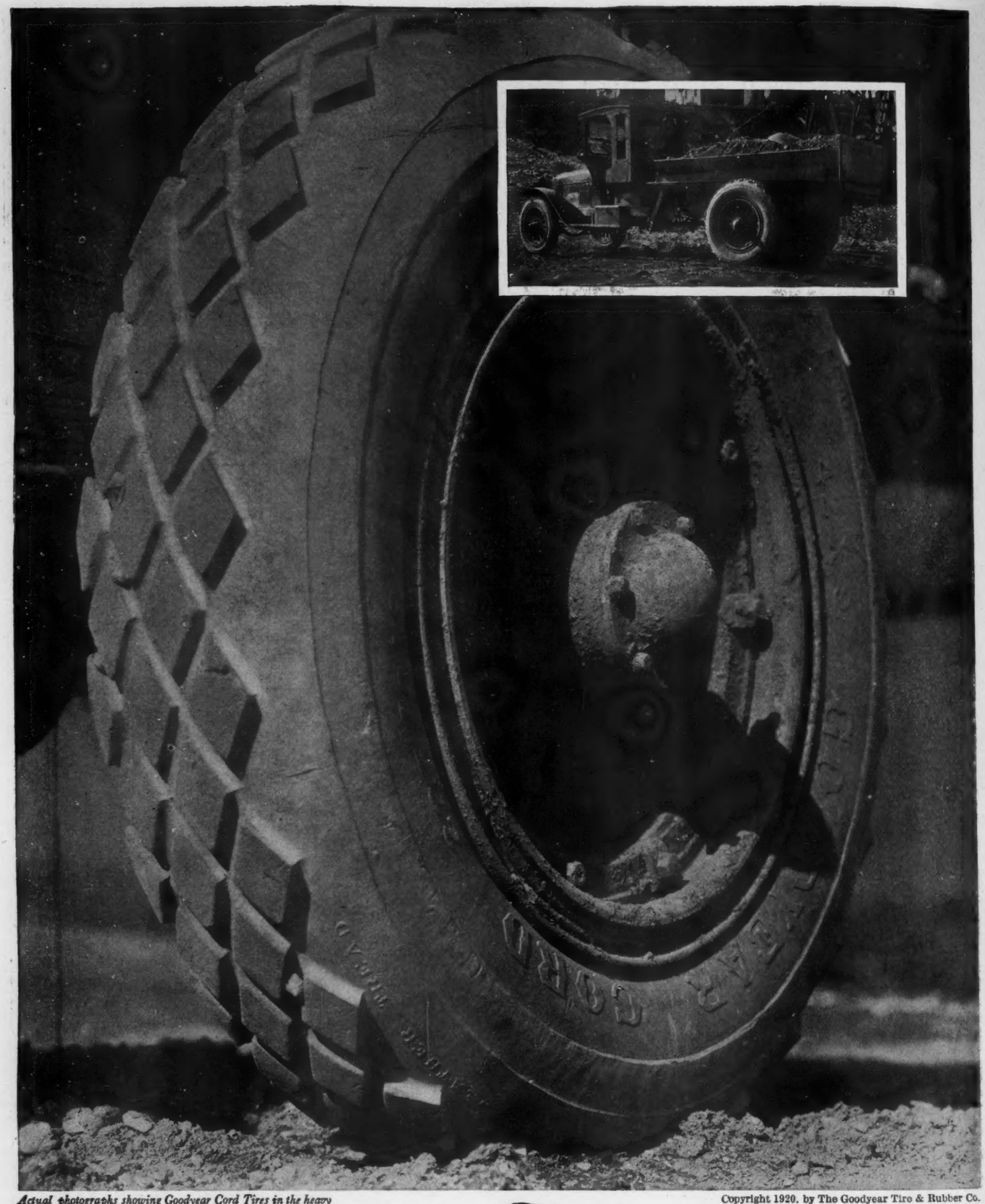
Tractors

Holton	Automotive	J. T.

COVERT GEAR COMPANY, INC.

Sales and Engineering: 967 Woodward Ave., Detroit, Mich. *Factory:* Lockport, N. Y.

Export Office: 100 Broad Street, New York



Actual photographs showing Goodyear Cord Tires in the heavy hauling service of W. S. Devenwater, Grand Rapids, Michigan

Copyright 1920, by The Goodyear Tire & Rubber Co.

GOODYEAR

Truckability—and Sales

"IN hauling yardage on contract my truck on Goodyear Cord Tires has made six to eight more round trips, of ten miles each, per day than any solid-tired truck on the same work. During a recent rainy spell my truck on Goodyear Cords was the only one hauling gravel to a mixer—the solid-tired trucks were stopped by soft going. This means money to me."—W. S. Devenwater, Contract Hauling, Grand Rapids, Michigan

THIS report reflects that tremendous country-wide experience which has demonstrated that the Goodyear pneumatic truck tires completely remove the handicaps of hauling on solid tires.

In pointing to the benefits of pneumatic traction, cushioning and nimbleness, it particularly reflects the vital results of Goodyear Cord construction, originated by Goodyear several years ago.

Goodyear Cord construction has made possible that decisive combination of resilience and toughness which, in turn, has made pneumatics entirely practical for heavy duty.

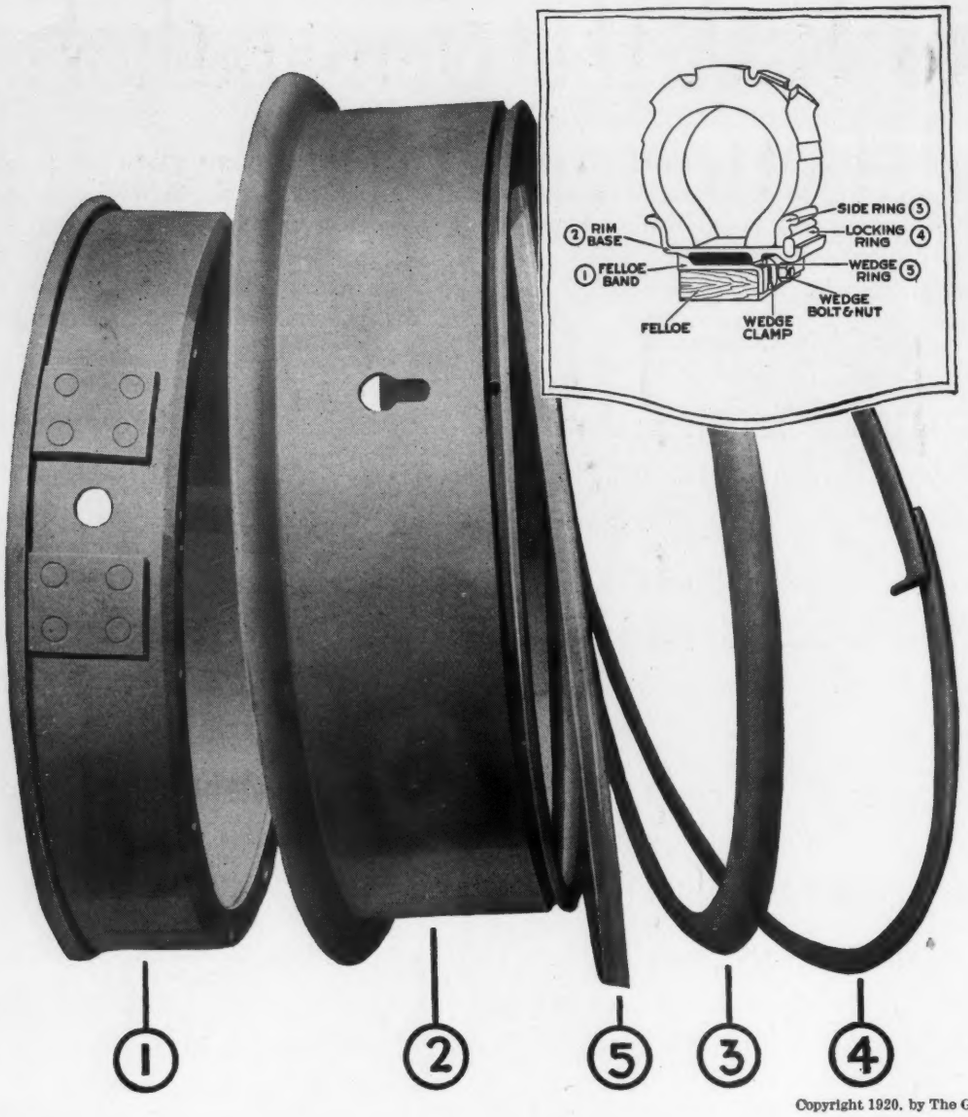
It is this construction which has furnished the basis of Goodyear's development of Goodyear Cord Tires for trucks and of Goodyear's establishment of pioneer motor truck lines running on these tires.

It is this construction, therefore, which has opened a wider sales field for the motor truck dealer by opening a wider field of usefulness for the motor truck.

The operating and cost data of trucks hauling on pneumatics now offer a powerful selling aid to motor truck dealers and can be obtained by writing to The Goodyear Tire & Rubber Company, at Akron, Ohio.

SAVE TRUCKS · LOADS · DRIVERS · ROADS
Haul on Pneumatics

CORD TIRES



Copyright 1920, by The Goodyear Tire & Rubber Co.

Rim Advantages for Truck Pneumatics

YEARS ago when Goodyear pioneered the straight side type of pneumatic tire, Goodyear also pioneered the type of rim which has made the use of this tire possible and practical.

Due to the fundamental simplicity and strength of the original Goodyear straight side rim, its design has served as the basis of practically all straight side rim manufacture.

The ease of operation of this Goodyear Rim, as now built for both passenger cars and motor trucks, is increased very effectively by a locking feature distinct among rims.

Its locking ring has an oval contour which facilitates engagement and release and thus makes for utmost stability and safety when locked and utmost ease of unlocking.

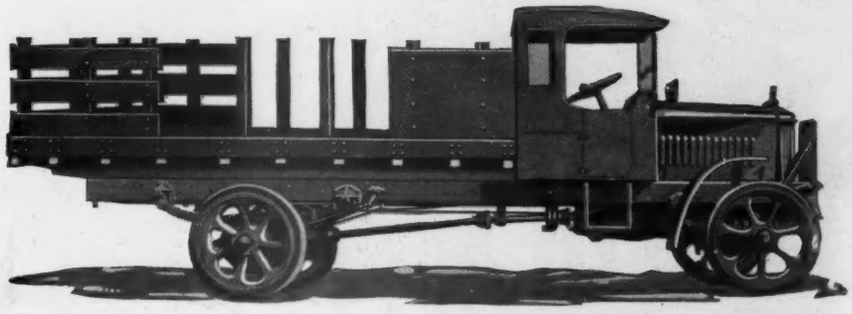
This at least partially explains why truck manufacturers have given such substantial recognition to Goodyear Truck Rims—made in all sizes and in both the demountable and detachable types.

Further information about these easily operated rims can be obtained by writing to The Goodyear Tire & Rubber Company, at Akron, Ohio.

GOODYEAR

TRUCK RIMS

Built to Meet the Demand for Better and Stronger Trucks



Motor truck users, familiar with the causes *determining* their transportation costs, are demanding better trucks.

They are demanding trucks of greater strength for a given capacity rating—more endurance, longer life, more dependable service. These qualities give more ton miles at less cost.

Jumbo trucks are considerably stronger than has been heretofore considered necessary for trucks of the same capacity.

This extra strength is provided not to encourage overloading but to assure greater reliability, longer life, lower upkeep cost.

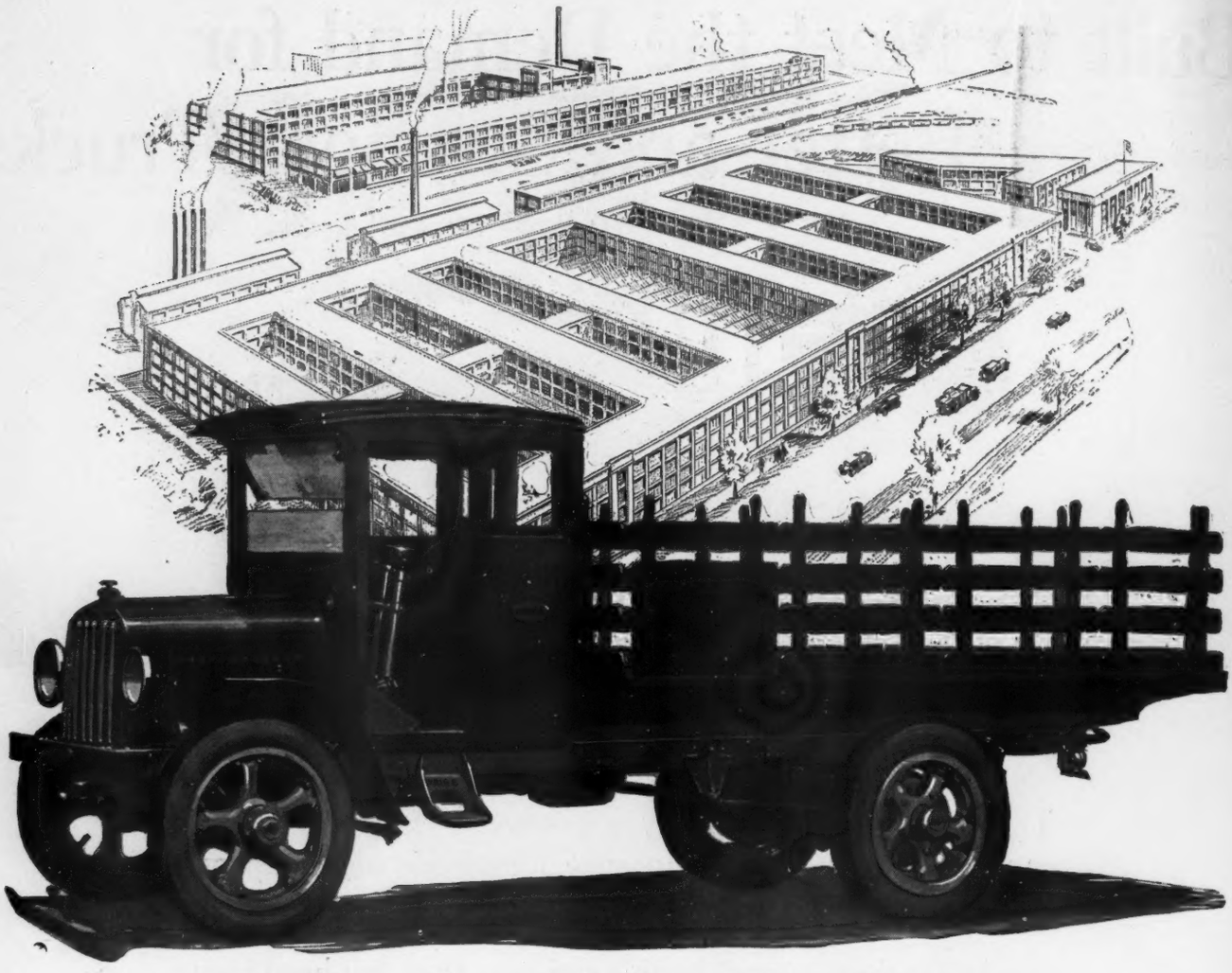
Hundreds of Jumbo trucks are giving that kind of service under severest operating difficulty. Satisfied Jumbo users are building bigger business for Jumbo dealers.

Write for Full Information

Nelson Motor Truck Company, Saginaw, Michigan

JUMBO

The Complete Truck



A Truck and Its Traditions

There could be no more eloquent testimonial to the stamina of Paige trucks than their demonstrated ability to perform an unusually large quota of severe haulage tasks, day after day and week after week, with scarcely a lay-up for either adjustment or repairs.

Performance of such dependable character is naturally a source of great satisfaction to us. For we measure our success as truck builders not so much by the larger number of Paige trucks in use as by the service which each individual truck renders to its owner and, through its owner, to the business world at large.

We prize very highly the respect in which the name Paige has been held during all of the ten years we have been building motor vehicles. And we shall continue to follow the policy of building into our products such honest excellence that they will always merit the public confidence reposed in them.

The pride which we take in our products gives you definite assurance that when you buy a Paige truck its performance will be of the same high character as that of the many other Paige trucks which have made good in actual service. The Paige nameplate is a guarantee on which you can always safely rely.

PAIGE-DETROIT MOTOR CAR COMPANY, DETROIT, *Michigan*

Manufacturers of Paige Motor Cars and Trucks

PAIGE

The Most Serviceable Truck in America

MOTOR TRUCKS

FULLER

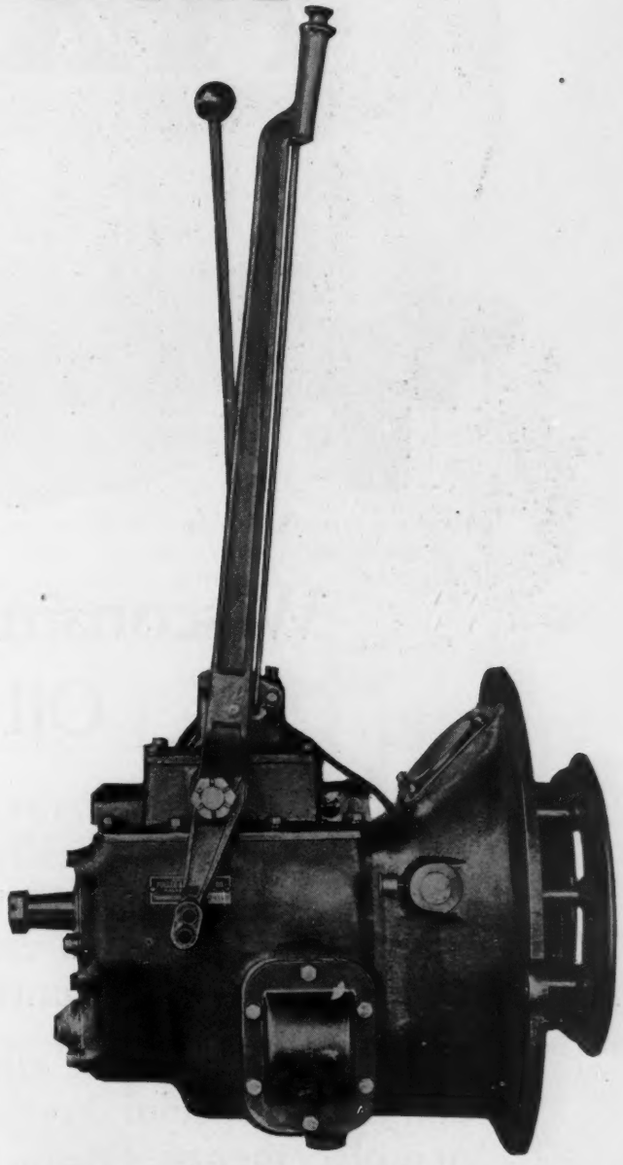
TRANSMISSIONS

Fuller Transmissions are durable.

The raw materials are carefully selected. The shaft and gear material is a special cross rolled 3½% nickel steel which, carefully heat treated after machining, gives long service.

Large size annular ball bearings are used, which give long service with minimum friction. Every part is made ample size to withstand the strains and wear they are subjected to.

The control levers are drop forging and will stand great stress before breaking.



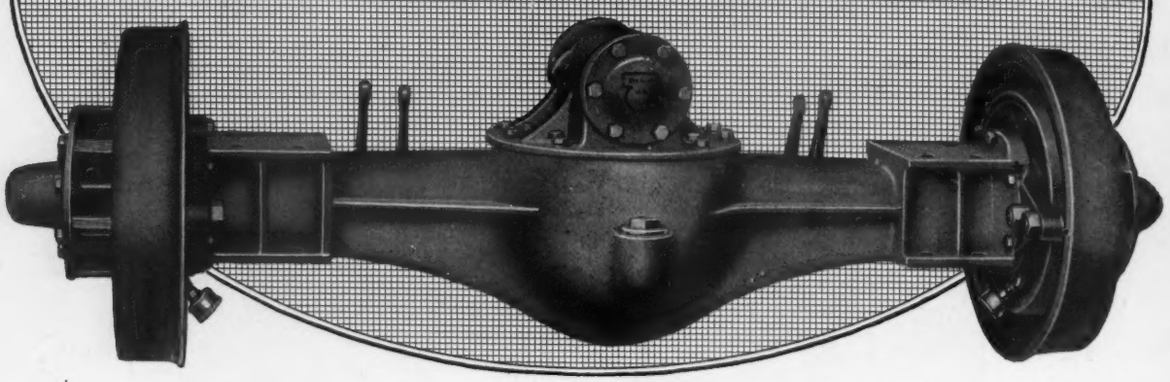
FULLER & SONS MFG. CO.

KALAMAZOO, MICHIGAN

Manufacturers of transmissions, clutches and controls exclusively

Kresge Bldg. - - - Detroit, Mich.
American Circle Bldg. - New York, N. Y.
Rialto Bldg. - - - San Francisco, Cal.

WISCONSIN AXLES



Wisconsin Axles in the Oil Fields

There is no harder service for trucks than in the oil fields. In Oklahoma the oil men demand Wisconsin Axles. They stand up under the hardest service. They track well in the poorest of roads where other axles cannot operate efficiently or successfully.

If trouble occurs the simplicity of construction demands no special knowledge to make adjustments or replacements. The materials are the best obtainable.

You will find them used only on high grade trucks.

WISCONSIN PARTS COMPANY, Oshkosh, Wisconsin

(15)

WISCONSIN CUSTOM BUILT AXLES

A plate-glass window, and what is back of it

Not merely a display of what you have to sell. It is much more than that. It reflects the degree to which your business has attained standing, dignity and substantial worth—in other words, it gives the world a distinct impression of your business personality.

A merchant's truck, and what is back of it

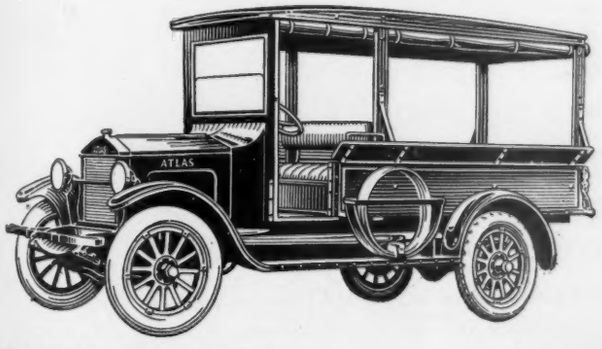
Your delivery truck should accomplish the same result. It should carry out into the residential or other business districts the distinct impression of your standing and good name.

A cheap truck reflects a cheap establishment. A truck that is not specially adapted in body design to your particular business is undermining your reputation.

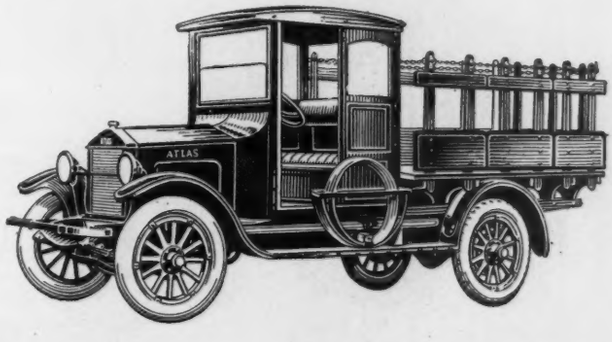
OVERSIZE ATLAS
MERCHANTS' DISPATCH

Oversize

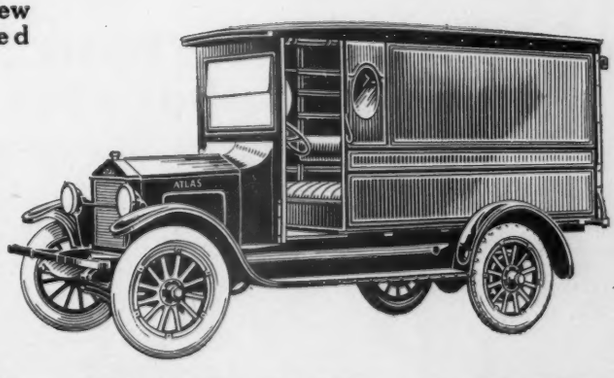
—the word is not a mere adjective as we apply it to the Atlas Truck; it's a characterization. It means: With strength, power and endurance to spare. The Atlas Truck's air of distinction is not merely a matter of external appearances. It is built throughout with the dominating idea that to measure up to its job is not enough—it must tower above it.



Model 978—Four-post New England type, entered from either side.



Model 1010 — Standard Truck type; platform is 65 in. x 7 ft. 6 in., with removable stakes. Write for catalogue.



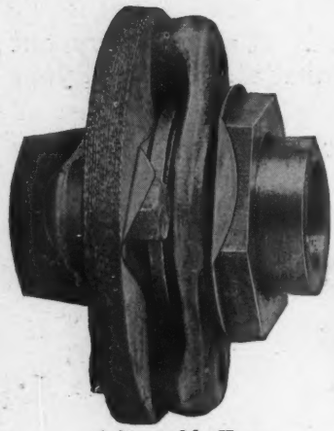
Model 968—Standard full-panel delivery car. 50 different bodies built for every business.

MARTIN-PARRY CORPORATION
York, Pennsylvania

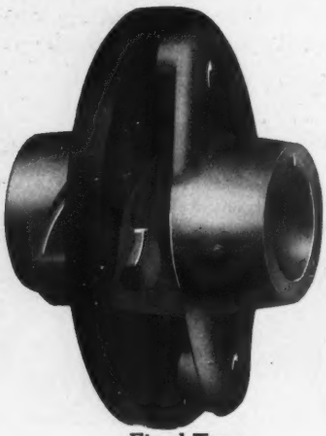
FLEXITE

TRADE-MARK REGISTERED

Standard Magneto Generator and Pump Couplings



Adjustable Type



Fixed Type

Send for Bulletin

SAVE TIME AND EXPENSE

Flexite Patented Couplings are made for every service where couplings are used in motor car design.

They are made to S. A. E. standard dimensions, and also to fit all standard engines, magnetos and generators.

Flexite Couplings are easily assembled, allow perfect adjustment and are securely locked as a unit after being assembled.

They reduce development costs.

They save time in production assembly.

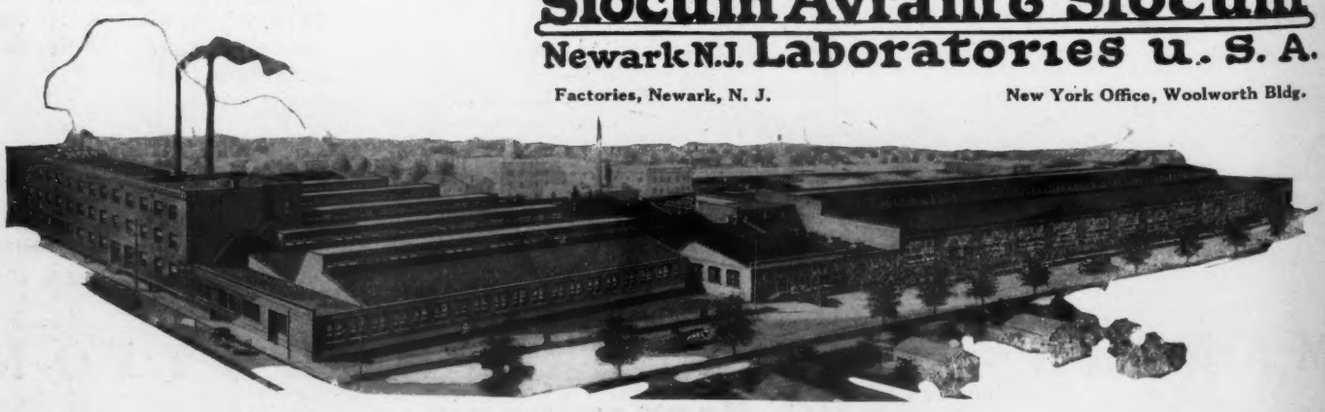
SLOCUM-AVRAM-SLOCUM MANAGEMENT

Makers of Flexite Patented Medium-Duty and Heavy-Duty Universal Joints and Body Hoist Couplings

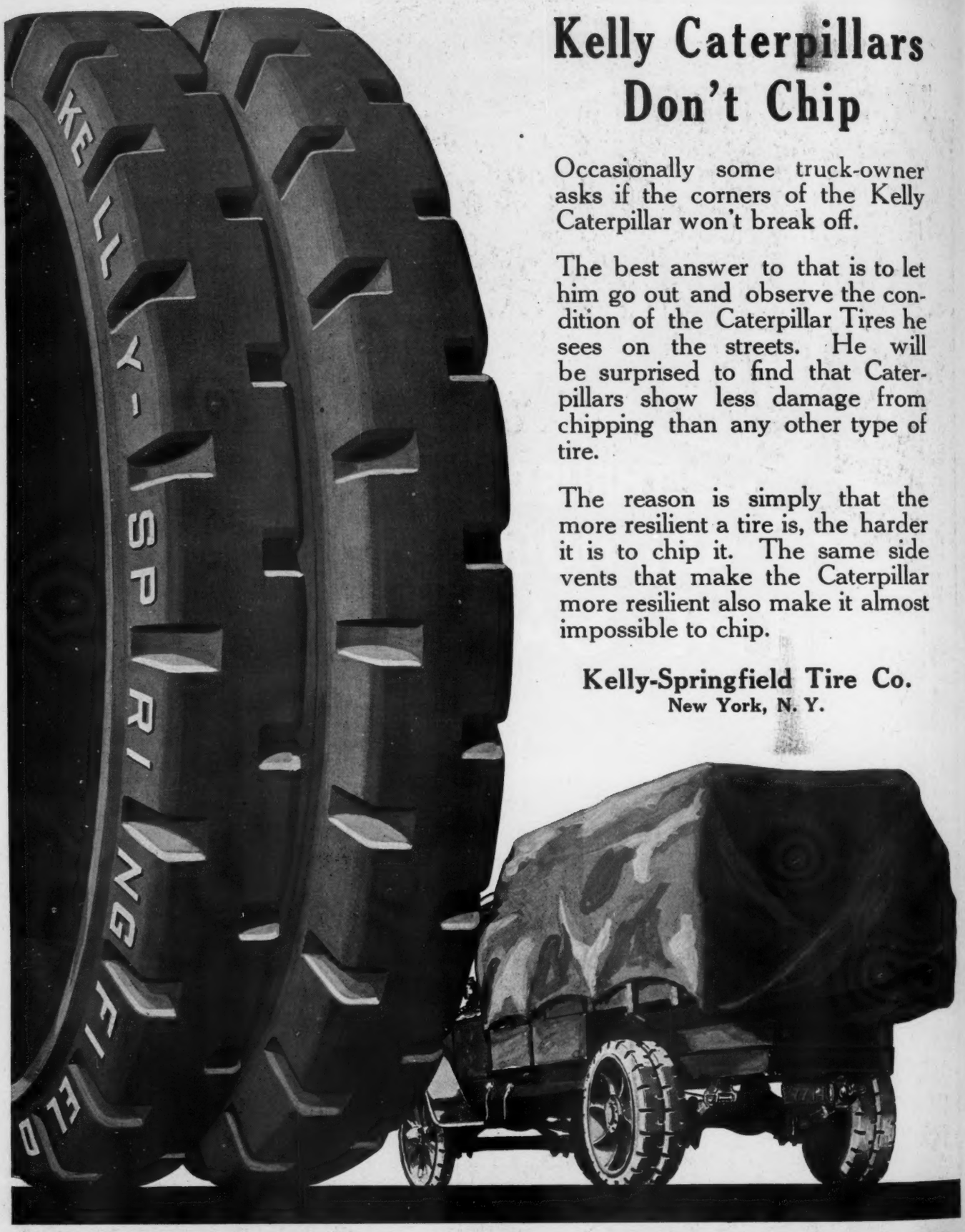
Slocum Avram & Slocum

Newark N.J. Laboratories U. S. A.

Factories, Newark, N. J. New York Office, Woolworth Bldg.




CARRIES THE LOAD
TAKES THE THRUST
THRUST STRAINS
ARE NULLIFIED IN
THE SAME WAY
Make Child's Play
ANYWHERE
of Load and Thrust
Without flanges upon the wheels of locomotives and cars our great modern transportation systems would be practically valueless.
The same flange principle ensures unusual efficiency in BOWER ROLLER BEARINGS—resists end thrusts and guides the bearing rolls in the raceways.
BOWER
ROLLER BEARING CO.
Detroit Michigan
BOWER SAVES POWER



Kelly Caterpillars Don't Chip

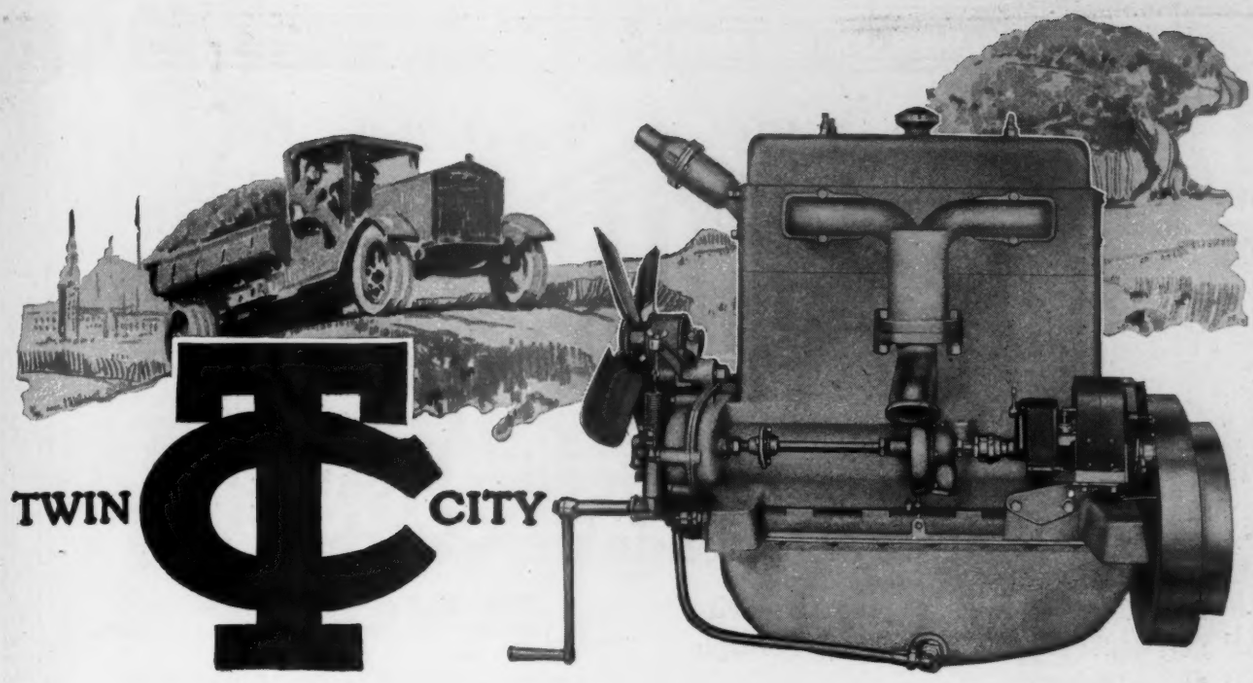
Occasionally some truck-owner asks if the corners of the Kelly Caterpillar won't break off.

The best answer to that is to let him go out and observe the condition of the Caterpillar Tires he sees on the streets. He will be surprised to find that Caterpillars show less damage from chipping than any other type of tire.

The reason is simply that the more resilient a tire is, the harder it is to chip it. The same side vents that make the Caterpillar more resilient also make it almost impossible to chip.

Kelly-Springfield Tire Co.
New York, N. Y.

KELLY SPRINGFIELD TRUCK TIRES



"Up and Over"

THE Twin City Truck Engine has the extra power to carry the load up and over the steep grades and through the tough spots.

The extra power is produced by the 16-valve-in-head arrangement. The double exhaust valves give perfect scavenging, leaving a clean cylinder for quick complete combustion of the new charge.

The Twin City Truck Engine has ruggedness of construction to match its extra power. This combination means the dependability that keeps the truck on the job and out of the repair shop.

Among special features are: Double valves to each cylinder; removable cylinder walls in direct contact with jacket water; removable cylinder head; counterbalanced crankshaft, drilled for pressure feed lubrication; large water jacket space;—fully enclosed yet easily accessible.

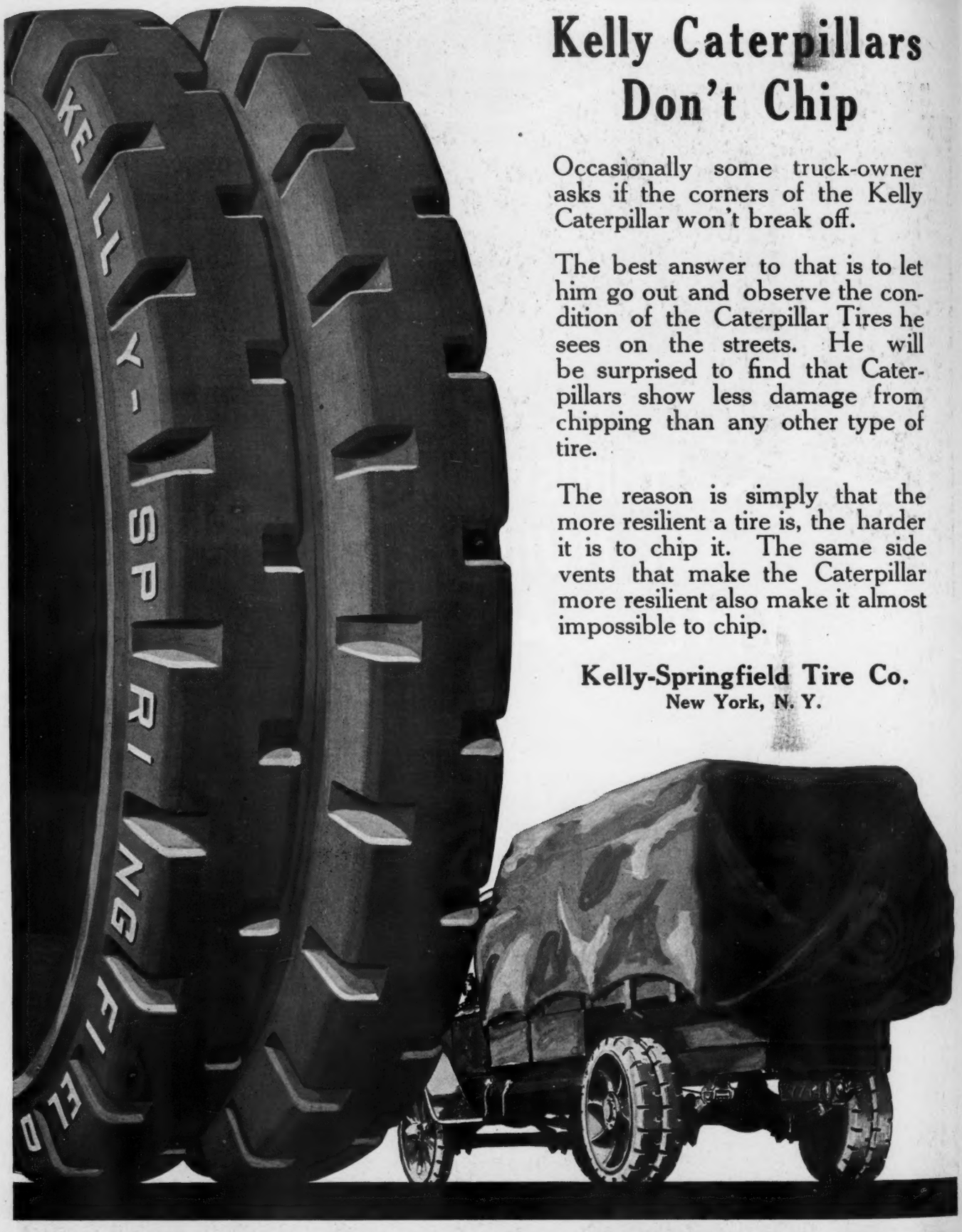
Twin City Truck Engines have proved themselves by performance. And they are produced by an engineering organization already famous for the development of heavy duty engines.

Write for details.

Minneapolis Steel & Machinery Co., Minneapolis, U. S. A.

TWIN CITY

16-Valve (Valve-in-Head) Engine



Kelly Caterpillars Don't Chip

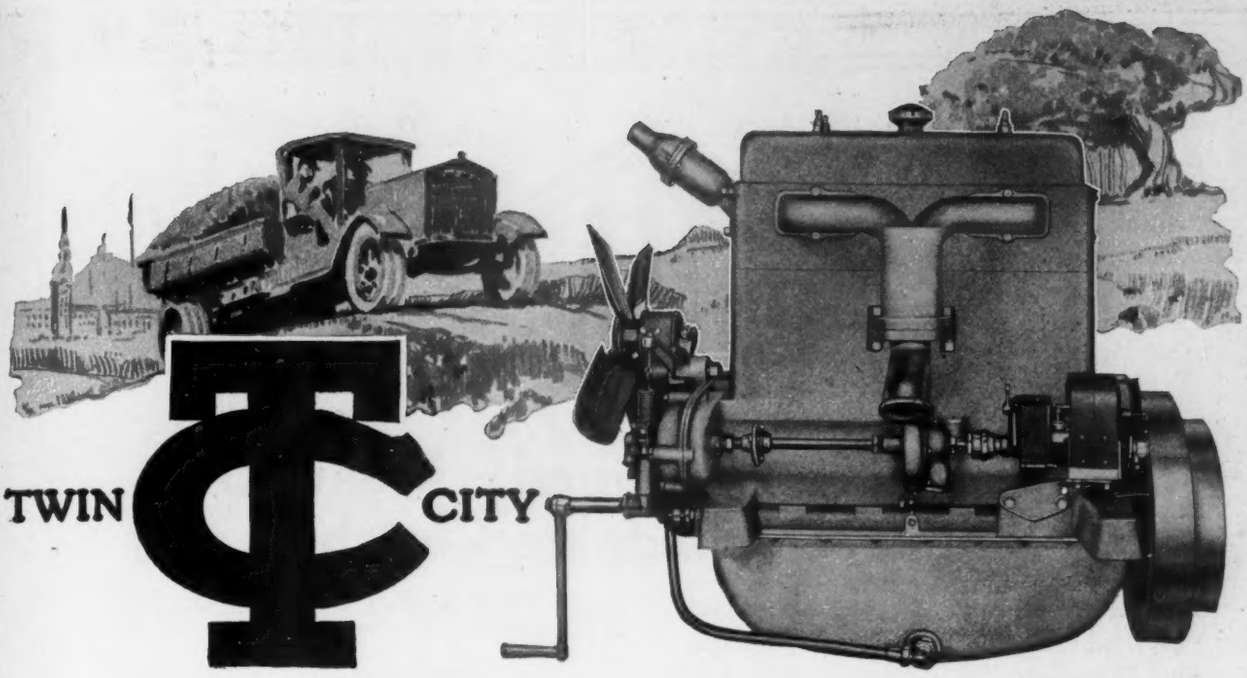
Occasionally some truck-owner asks if the corners of the Kelly Caterpillar won't break off.

The best answer to that is to let him go out and observe the condition of the Caterpillar Tires he sees on the streets. He will be surprised to find that Caterpillars show less damage from chipping than any other type of tire.

The reason is simply that the more resilient a tire is, the harder it is to chip it. The same side vents that make the Caterpillar more resilient also make it almost impossible to chip.

Kelly-Springfield Tire Co.
New York, N. Y.

KELLY SPRINGFIELD TRUCK TIRES



"Up and Over"

THE Twin City Truck Engine has the extra power to carry the load up and over the steep grades and through the tough spots.

The extra power is produced by the 16-valve-in-head arrangement. The double exhaust valves give perfect scavenging, leaving a clean cylinder for quick complete combustion of the new charge.

The Twin City Truck Engine has ruggedness of construction to match its extra power. This combination means the dependability that keeps the truck on the job and out of the repair shop.

Among special features are: Double valves to each cylinder; removable cylinder walls in direct contact with jacket water; removable cylinder head; counterbalanced crankshaft, drilled for pressure feed lubrication; large water jacket space;—fully enclosed yet easily accessible.

Twin City Truck Engines have proved themselves by performance. And they are produced by an engineering organization already famous for the development of heavy duty engines.

Write for details.

Minneapolis Steel & Machinery Co., Minneapolis, U. S. A.

TWIN CITY

16-Valve (Valve-in-Head) Truck Engine

The Velvet Clutch *With the Bull-dog Grip*

DETLAFF

"Detlaff Equipped" Means Simple, Dependable Clutches

Detlaff clutches have the simplicity and dependability inherent in multiple disc clutches.

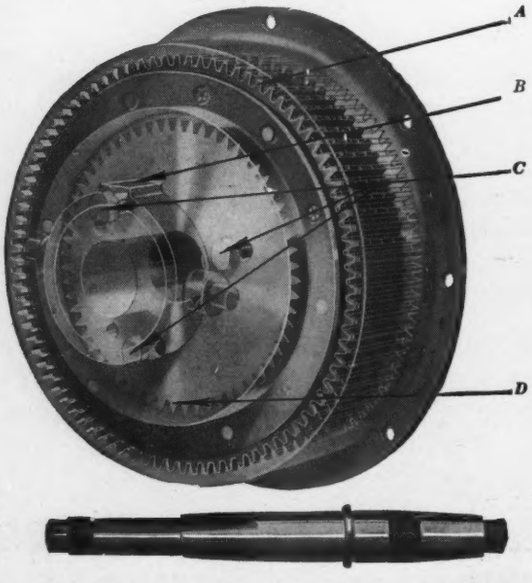
But they are more than just "multiple disc clutches." Maximum driving surface for the discs prevents dragging and backlash. Large friction surface means long life. Specially designed springs make frequent adjustments unnecessary. Unit construction results in easy assembly.

The most thorough testing under overload makes certain that every installation will prove satisfactory under any conditions.

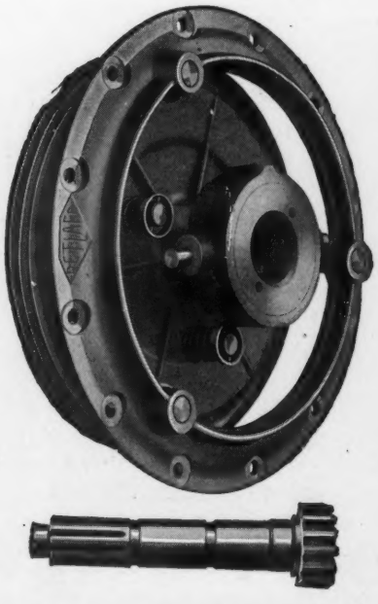
Our engineering department will gladly co-operate with you to give you the proper Detlaff for your working conditions and to fit it to your layout.

A. J. Detlaff Company

124 Lafayette Avenue, East **Detroit, Michigan**

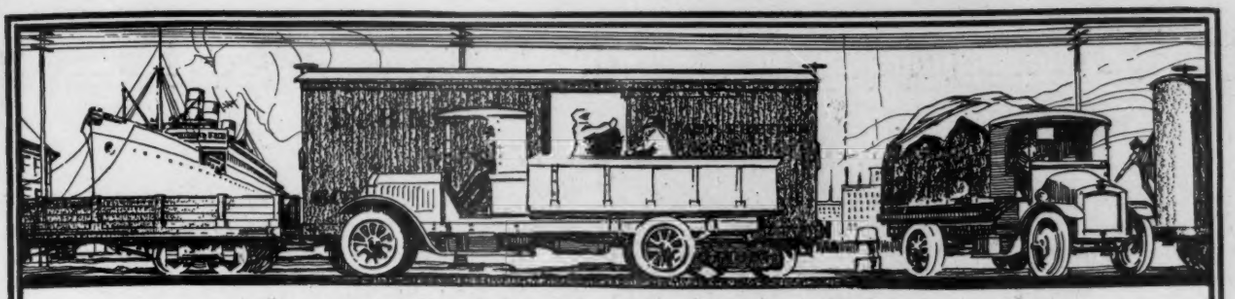


A and *D*. Gear tooth drive on all discs.
B. Lubrication from any convenient point.
C. Long, easy springs compensate automatically for facing wear.



This simple, reliable, long-lived, Detlaff disc clutch replaces a plate clutch without change in layout.

(37)



National Guarantee Credit Corporation
Capital $5,000,000
Philadelphia, Pa.

MONEY MAKES MOTORS MOVE

From Manufacturer

There *is* a best method by which to finance your Motor Cars, Trucks, Tractors, Farm Machinery, Lighting Plants, etc., and that is the

NATIONAL WAY

The only constructive Financial Plan for Automotive Dealers in the nation today.

Ask for Copyrighted Booklets.

To User

Dollars for Dealers
A Constructive Financial Plan

Profits
For Automotive Merchants

National Guarantee Credit Corporation

1200 Franklin Bank Bldg., Philadelphia, Pa.



COPYRIGHTED



Hauling 14,630 Pounds

The above photograph shows a 3½-ton truck and a 2¾-ton WARNER TRAILER hauling a 14,630 pound load. The distance was 56 miles over rough, rutted roads. The round trip for the truck and trailer was made in twelve hours.

This is only one of the instances of the way WARNER TRAILERS are solving the hauling problems and reducing hauling costs. In addition WARNER TRAILERS lower maintenance costs, reduce labor and speed up delivery. Many concerns have been able to save the purchase cost of additional trucks because WARNER TRAILERS in some size and shape multiply the efficiency of trucks already in service and do more work with less labor and at a lower cost.

Each WARNER TRAILER is scientifically built. Just as much care is taken as in building a high grade motor truck. In many respects the Warner Heavy Duty Truck Trailer is a truck chassis minus the power plant.

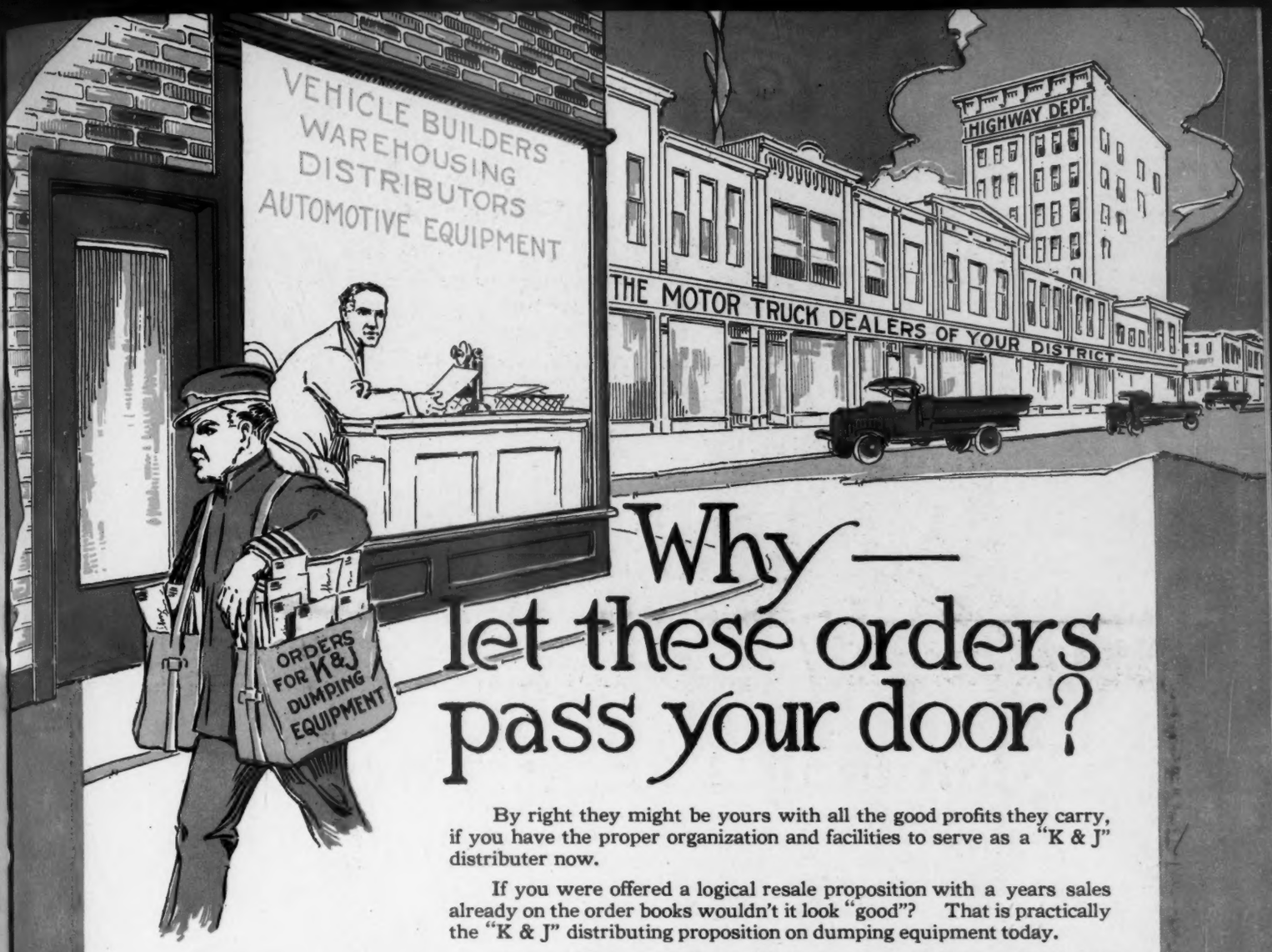
WARNER TRAILERS are solving hauling problems for firms in widely different lines of business. Let us show you how it will do the same thing for you. The advice of our Engineering Department is gratis.

WARNER MANUFACTURING COMPANY
23 Main Street, Beloit, Wis.

WARNER

HEAVY DUTY TRUCK TRAILERS

TWO AND FOUR WHEEL TYPES



Why — let these orders pass your door?

By right they might be yours with all the good profits they carry, if you have the proper organization and facilities to serve as a "K & J" distributer now.

If you were offered a logical resale proposition with a years sales already on the order books wouldn't it look "good"? That is practically the "K & J" distributing proposition on dumping equipment today.

State and County Highway Departments are waiting ready to buy "K & J" Standardized Dumping Equipment. Hundreds of Government Army Trucks have been delivered to every state by the Federal Government. Practically all must be provided with dumping equipment.

This emergency is important and must be met. If you will help meet it you can rightfully command a big and immediate profit.

Under today's conditions our very liberal discount to distributers represents only part of your possible net--because of the abnormally low selling cost at which this business now can be taken.

The commercial demand--a permanent market--is large and swiftly expanding. Establish yourself NOW as a dumping equipment distributer--for "K & J" Standardized Dumping Bodies and Hoists are a highly stockable commodity. The line is complete--six distinct types of bodies and many sizes all easily mounted on any chassis frame. Simple, powerful "K & J" Hoists are supplied--an easily lifting hand hoist is optional with a light power hoist for lighter mountings up to $2\frac{1}{2}$ tons capacity. The "K & J" Giant Lift Power Hoist is provided for heavier mountings.

A simple hand adjustment fits a "K &J" Standardized Dumping Body to any width chassis frame and simple tools mount them.

The principles of these hoists are simple and well established. The hand hoist is cranked easily from the main shaft in lifting all ordinary loads. For heavier lifts, or for starting the load an auxiliary shaft offering a further two to one reduction is furnished.

Keep these points well before you--You can establish yourself with the line NOW with a waiting list of buyers. Our huge facilities ensure you deliveries. But the opportunity is NOW—not in six months or a year--but NOW. Write us NOW for our distributer's proposal.

The Kilbourne & Jacobs Mfg. Co.

NEW YORK
120 BROADWAY

Columbus, Ohio, U. S. A

ADDRESS
DEPT. 013 R

THE SEAL OF SATISFACTION K&J

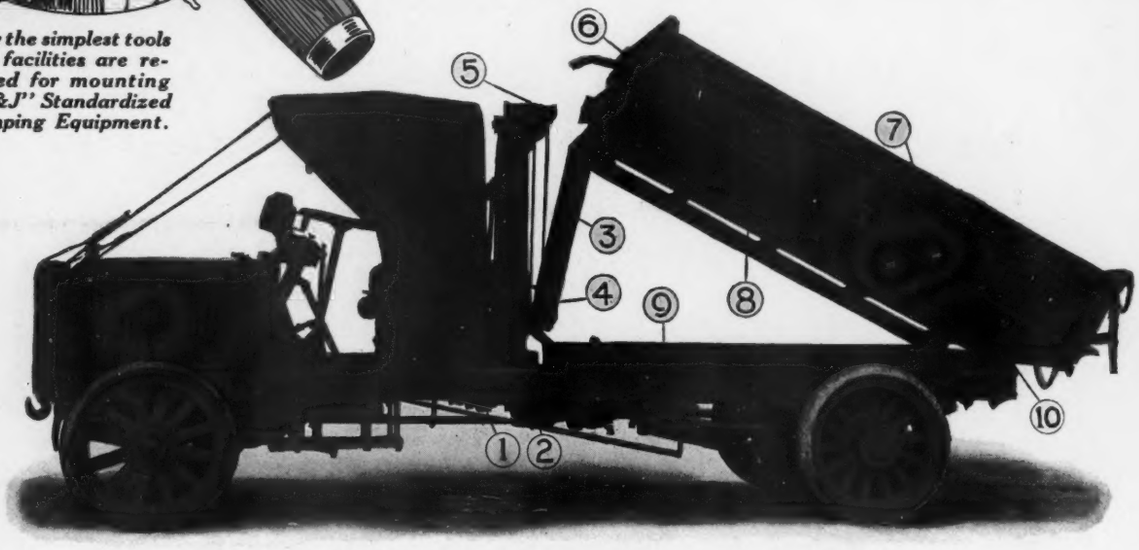
TRADE MARK REGISTERED



Only the simplest tools and facilities are required for mounting "K&J" Standardized Dumping Equipment.

What is The "K & J" Automatic Power Hoist?

The "K & J" Automatic Power Hoist is a simple, one speed transmission driving a worm and is used to transmit the motor's power to lift a body rather than for driving wheels. As a one speed "lifting" unit it operates about 1/30th as much as your four speed "driving" unit ensuring long life with minimum of upkeep.



Government Army Truck—Type "Packard"
(In Partial Dumping Position)

Equipped with "K & J" Automatic Power Hoist and "K & J" Standardized Steel Dumping Body

1. Power Hoist is driven from "sliding jaw" clutch on propeller shaft through a chain. Rugged, simple, positive, controlled by lever easily reached from driver's seat.
2. Sturdy bracket on hoist base provides means of quickly attaching hoist to chassis frame.
3. Hoisting arms shipped attached through rugged brackets riveted to lower front corners of body and to front I-Beam cross-member. Arms fold flat under body. In dumping they travel rails leading up hoist columns. No stiff arms projecting below top of chassis frame to cause trouble in dumping on uneven ground.
4. Power hoisting mechanism automatically disengages at total lift and total descent, also can be disengaged manually at any desired angle up to 45° worm lock holding body without brakes or clutches. Can be re-engaged for travel either up or down. Driver may start with body at full dump. Hoist will lower body and disengage with truck in motion. Entire mechanism housed in bath of non-fluid oil. No pumps, cylinders or pistons. Hence small upkeep cost.
5. Overall hoist height always low--no rising members. Cable winds on grooved drums applying lift at lower, front body corners, first directly then through hoisting arms, practically eliminating back pull on hoist.
6. Partial dumping tail-gate control, manually operated from drivers seat allows "spreading" load with truck moving. Quadrant at handle is ratcheted. Control lever engages any notch to regulate tail-gate opening.
7. Body splendidly fabricated. Lower inside corners rounded--no clogging and consequent rust. All inside rivets countersunk. Sides flared for extra strength and front crowned avoiding spill upon hoist or chassis. High hinged tail-gate for dumping clearance.
8. Rigid and adjustable underframe permits quick fitting to any width chassis frame without shop process.
9. Deep hard wood "cushion" sill strengthens frame and provides buffer against body--also takes away certain vibration strains from motor, transmission and axle.
10. Stout hinges provide rigid attachment of dumping body to truck frame at rear and tend to prevent side-sway in dumping.

The Kilbourne & Jacobs Mfg. Co.

NEW YORK
120 BROADWAY

Columbus, Ohio, U. S. A.

ADDRESS
DEPT. 013 R

THE SEAL OF SATISFACTION K&J

TRADE MARK

Efficient Cooling

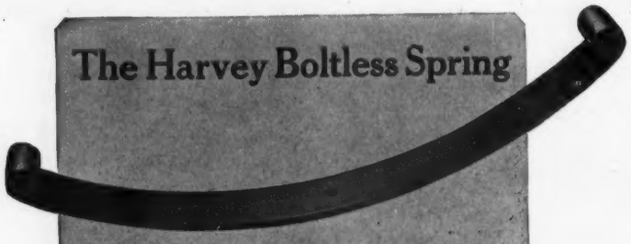
Oakes Fans

Right design, high grade construction, dependable bearings, utmost cooling capacity, quiet operation, long life -- these qualities make Oakes Fans first choice of over 250 well-known automotive makers

The OAKES COMPANY
Indianapolis, U.S.A.

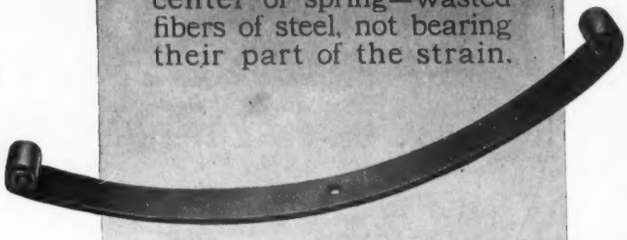


Unbroken Lines of Strength in the Harvey Boltless Spring



The Harvey Boltless Spring

An indention forged hot to force a bead on opposite side of leaf is the means of holding leaves rigid in the clutch of the spring clip. Thus the "lines of strength" are unbroken. No hole anywhere. Fibre of steel is unbroken—no metal removed. This is the Harvey way.



The Common Spring

At the center, where the spring bears greatest strain, is the weakest spot caused by punching a hole to accommodate a bolt, the common method of spring fastening. The "lines of strength" are broken by the hole in center of spring—wasted fibers of steel, not bearing their part of the strain.

TWO methods were employed to make the Harvey Spring excel in strength so that a broad guarantee could be offered safely with every sale. The center hole was eliminated so there are no weak spots. Then the Harvey patented process of heat treating and tempering was solved. These two factors have made the Harvey known in motordom as a spring in which the motorist can place utmost confidence.

Dealers are invited to write for the Harvey book containing specifications for over 1000 kinds of Harvey Springs; also for information regarding our dealer co-operation.

Harvey Spring & Forging Co.
1053-17th Street Racine, Wis.

No longer need automobile spring sales mean added responsibility and eventual trouble for the dealer. He can sell the Harvey Boltless Spring with a guarantee that really protects. Also he can assure resilience that gives the motor car extreme riding ease and eliminates the jolts that wear down tires and mechanism prematurely.



What is the Real Factor which Determines the Buying Decision

By George A. Kissel

Motor transportation has entered upon a new era—at a time in the manufacturing, industrial and transportation condition of the country when dependability, economy, adaptability and confidence are absolute necessities. There can be no temporizing. Your transportation problem is not merely the selection of a truck—it is the adoption of a basic principle—of relying on your confidence in the maker and in the efficiency of his product.

But, what is this controlling impulse that leads you to accept without question certain commodities at their face value and approach others with doubt and hesitation?

It's Confidence! Confidence is the real factor which determines the buying decision—confidence created by age, reputation, performance, stability, permanency, and consistent service over a long period of time.

It takes many long years to create confidence in a product to that point where the mere mention of the manufacturer's name carries conviction to the buyer that his confidence can be safely placed.

There is no secret about building trucks—factories can be duplicated—so too, the motor, the transmission, frame—all the chassis units.

But—the one factor that cannot ever be duplicated is **experience in designing and construction**—of **studying, analyzing and probing transportation needs** of every line of business.



Kissel Trucks on America's "Bread Line"

Establishing Buying Confidence

Into every Kissel Truck fourteen years of experience are built, and as each year has passed, our confidence has grown and grown until Kissel Trucks have become **a product of confidence.**



"Old Iron Sides," a Kissel Truck that has Upheld Kissel Confidence for Over 250,000 Miles.

The real test of any truck is the time test—what a truck has done over a period of years you can continue to expect of it—because the manufacturer's reputation exacts it of him.



Kissel Truck on America's Good Roads Construction Program

Kissel reputation was built on a combination of dominating principles of construction put together with all the accuracy the best engineering skill is capable of, and embodying the ideals born of many years of truck building.

The result—the Kissel Truck of today is an evolution—a constant striving toward an ideal from which the Kissel reputation was born, to grow to the rank it has attained today.

We realized many years ago that getting transportation costs down was one thing—**and keeping them down another thing.**

Kissel Trucks owe their reputation for dominant performance and stability to not one particular feature, but rather to the **combination of practical mechanical features taught us by experience.**

Fundamental truck essentials are closely guarded by Kissel engineers throughout the chassis, giving that **certainty of performance** and **stability of operation** that create confidence.

Creating Permanent Confidence

Permanency is a by-product of confidence, because the manufacturer in building confidence must erect his structure on a permanent foundation. It was only by building the Kissel factories complete in themselves—of forming permanent financial connections—of perfecting an organization of trained men and skilled engineers that Kissel Trucks could merit the public's confidence—and to keep that confidence demands our expanding our facilities, equipment and labor. Sons work alongside of their fathers—each year sees more and more Kissel homes going up, to be handed down to the new generation that will uphold the Kissel confidence long after you and I have finished our work.

"Old Iron Sides" one of the first Kissel Trucks built is, after over two hundred and fifty thousand miles, still giving uninterrupted service. True, it has had many changes—a new hood—cab—wheels—many tires and bodies—but the original motor—frame—axle—bearings, are still good—proclaiming that confidence was built into Kissel Trucks **from the very first.**

How Confidence in Kissel Trucks has been Created

We have deliberately created buying confidence in Kissel Trucks and with equal deliberation and determination we are furthering this confidence through constant study and experiments.

Take the stability of the Kissel-built motor, designed, perfected and manufactured for truck power purposes only. A corresponding high degree in perfection is in the axles, massive frame, brakes, with a large factor of safety—heavy, flexible springs of especially selected steel—pressed steel frames built with practical reference to overloads. In Agricultural America, moving the bumper crops and keeping up the meat supply—in County and Municipal work—on America's mammoth good roads program—for manufacturers, wholesalers merchants—Kissel Trucks are creating more and more confidence.



Kissel Truck on America's "Firing Line"

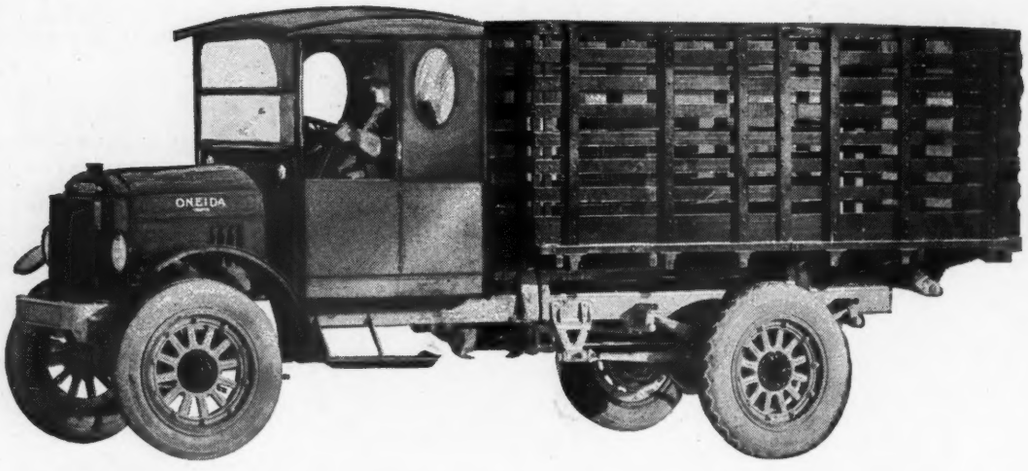
Built in five sizes, from our "General Delivery" model for quick delivery, to the mammoth "Goliath" model, a giant in power and a brute for work.



Kissel Truck on America's Great Building Program

In addition, Kissel designing construction and easy accessibility of all parts, simplify any service work, while standardized parts and a wide distribution of service depots, assure low upkeep expense.

Further details with specifications and data on request from nearest Kissel dealer or Kissel Motor Car Co., Hartford, Wis



A Hit at Both Truck Shows!

"No single exhibit is attracting more attention at the National Truck Show than the exhibit of new Oneida Truck Models."—New York Sun, Jan. 6th

The above comment sums up the general opinion of automotive experts, newspaper automobile editors, and critical dealers, both at the New York and Chicago Motor Truck Shows. Oneida "Uncommon Carriers"—the gasoline-driven for sturdy, reliable and speedy long-distance work, and the 2-ton electric-propelled for city deliveries—meet every haulage need.

ONEIDA

DEALERS, write for details on the Oneida Line. Your field may still be open. Address the factory at Green Bay, Wis.

ONEIDA MOTOR TRUCK COMPANY
1201-1300 S. Broadway Green Bay, Wis.

"Comparison Proves Oneida Quality"

ONEIDA

(pronounced O-ny-da)

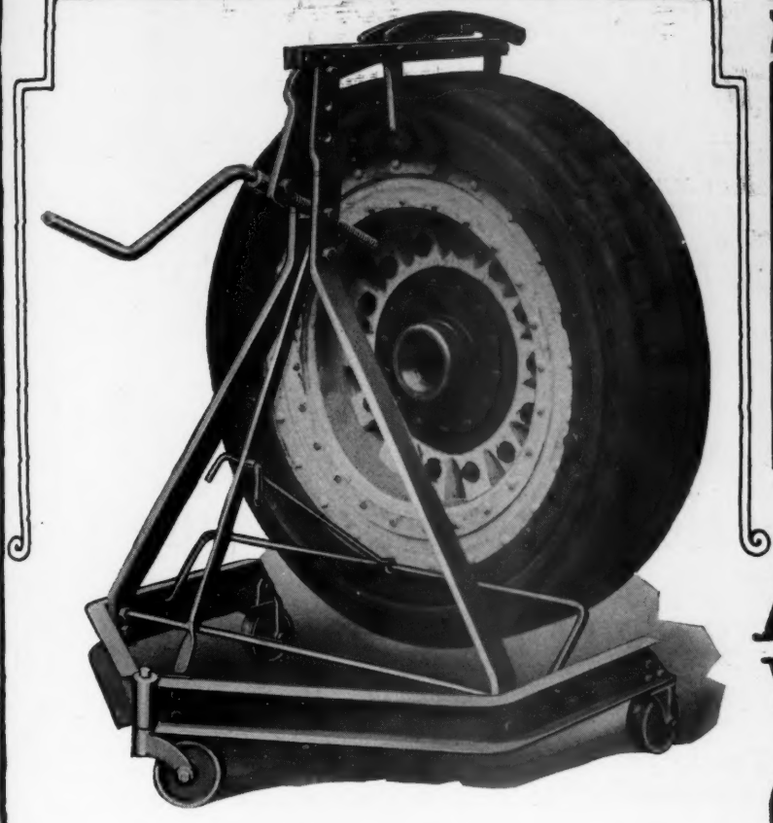
MOTOR TRUCKS

"Uncommon Carriers"

1¼ to 5 Tons

Heavy Wheels - Off or On

One Man - One Minute





ATLAS WHEEL CRANE

For motor truck dealers and manufacturers—for fleet owners and garage men—for anyone who has to handle the heavy wheels of motor trucks. You know what a mean job it is—the tremendous weight—three or four men—crowbars and make-shift tools—two or three hours at best—risk of personal injuries and damage to bearings and brake linings. Not only that—but the earning power of the truck stands idle. The Atlas Wheel Crane brings an easier, better way and it quickly

Pays for Itself in Time and Labor Saved

The Atlas Wheel Crane does this mean job—does it with one man—does it in only a minute of time—does it without risk of injury or damage.

The grab-hooks of the crane will work under any fender and grip the steel rim of the wheel on each side. They lift just enough to suspend the wheel, so that it slips off easily when the crane is rolled back, and they hold it in exact vertical position to slip it into place again when ready.

The Atlas Wheel Crane must be and is powerfully built. Every part is made several times stronger than necessary. Except the casters, every part is forged, machine or channel steel, the strongest possible construction being used where the strain is greatest. There must be no costly failure in any part.

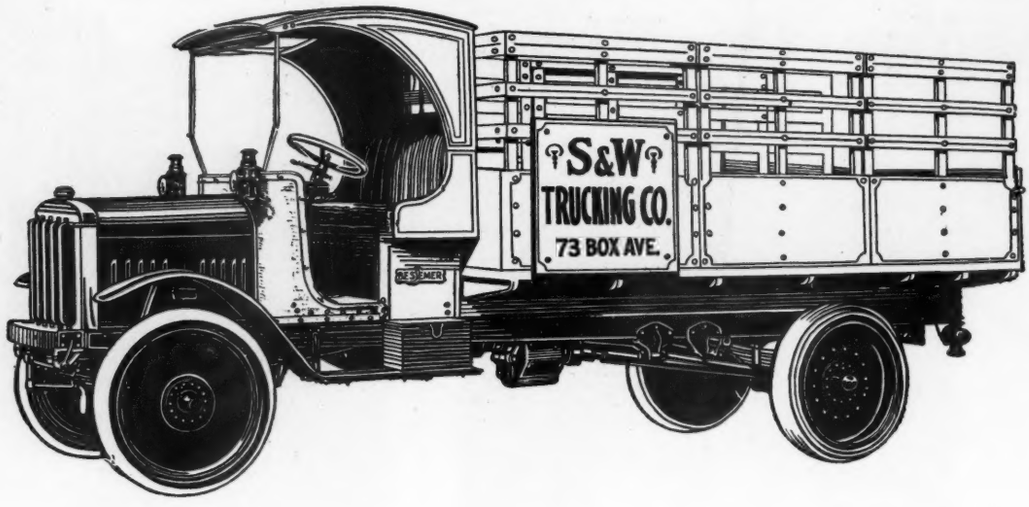
With this crane, the heaviest truck wheels are as easily handled as those of a Ford. It will lift a ton and will not break. The crane is adjustable to any kind or size of tire.

Price, $80.00, f.o.b. Columbus, Ohio
Special Grab Hooks for Pneumatic Tires, $6.00 Extra

If you handle heavy truck wheels, an Atlas Wheel Crane will be a Big Money-saver for you.
Order yours NOW, or write at once for further information.

THE THOMSON AUTO SPECIALTIES CO.

Dept. A3. 36-38 E. Chestnut St., Columbus, Ohio



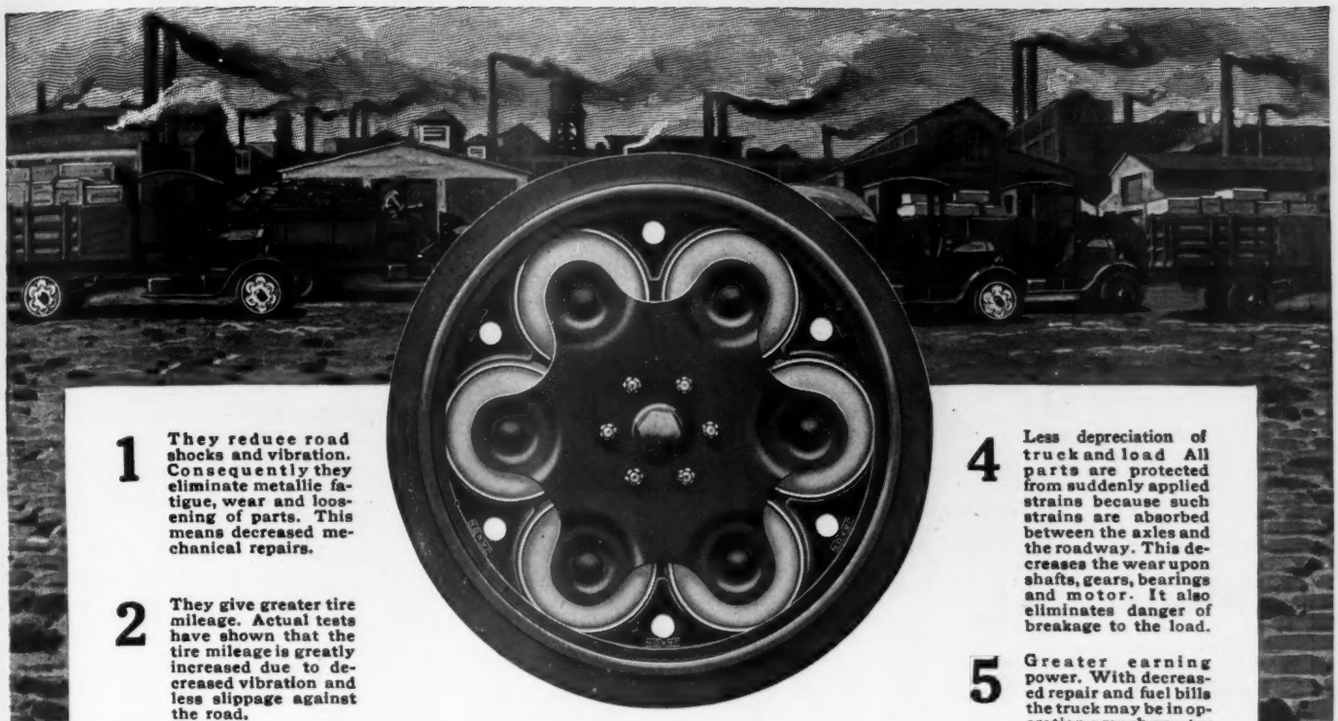
A Bessemer Dealership Will Measure Up to Your Requirements for Service

How the factory fits in. The Bessemer factory is always "on its toes" when service or adjustments are required by our dealers. Service for dealers comes ***first*** in our plant. When a dealer assures a Bessemer Truck owner of service he ***knows*** that we will live up to our part of the job. That's why Bessemer dealers hold the confidence of owners; and service like this means repeat orders.

How the truck helps out. The Bessemer Truck has proved its right to its reputation for dependable, continuous service. No work is too strenuous for the Bessemer; no feature that makes for years of hard, every-day service has been omitted. It is a fact that unit for unit, size for size, Bessemer Trucks compare to advantage with any others on the market—and actually sell for $300 to $600 less. The line is complete—1, 1½, 2½ and 4 tons.

If you are looking for a truck dealership, that measures up to your ideas of service, both from the manufacturer and the truck itself, investigate our proposition. Drop us a postcard for details.

BESSEMER MOTOR TRUCK CO.
GROVE CITY, PENNA.



1 They reduce road shocks and vibration. Consequently they eliminate metallic fatigue, wear and loosening of parts. This means decreased mechanical repairs.

2 They give greater tire mileage. Actual tests have shown that the tire mileage is greatly increased due to decreased vibration and less slippage against the road.

3 Greater fuel economy. Because the tires are always kept in contact with the road, instead of continually bouncing over and grinding against obstructions, fuel consumption is greatly reduced.

4 Less depreciation of truck and load All parts are protected from suddenly applied strains because such strains are absorbed between the axles and the roadway. This decreases the wear upon shafts, gears, bearings and motor. It also eliminates danger of breakage to the load.

5 Greater earning power. With decreased repair and fuel bills the truck may be in operation a much greater part of the time. A greater hauling area may be covered because of the increased permissible speed.

6 Prolongs the life of the truck. Wear and tear upon all working parts due to shocks and vibrations are reduced to a minimum.

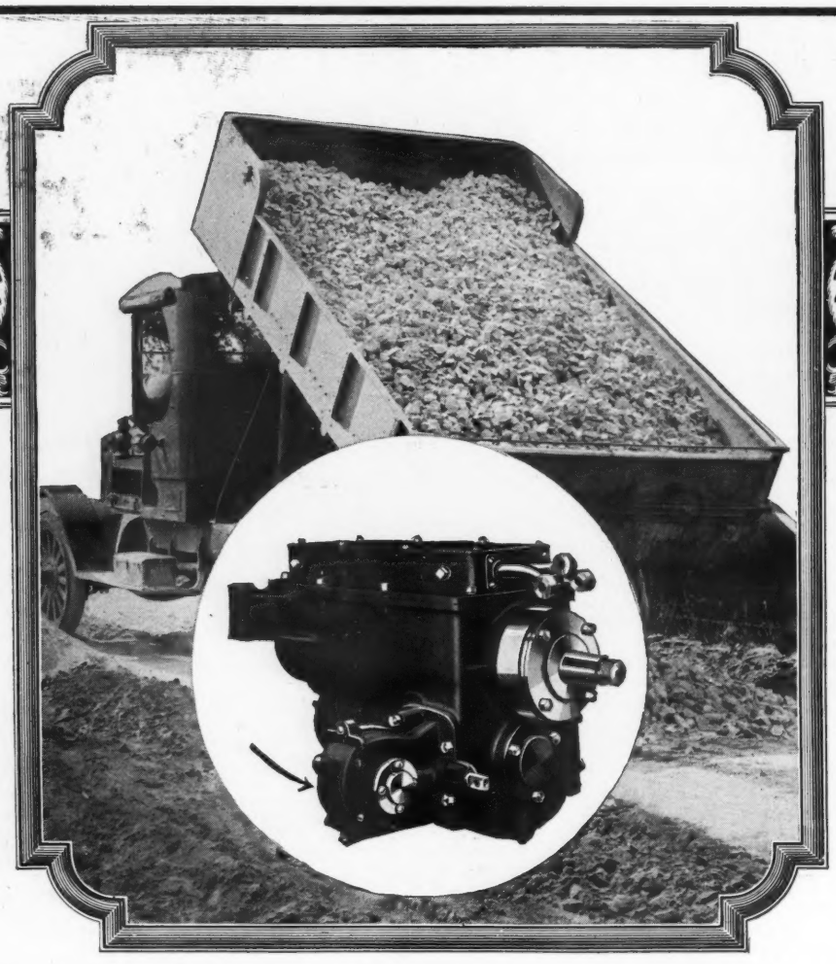
7 Absolutely guaranteed. Jaxon Wheels are guaranteed against defective workmanship and materials and are guaranteed to perform satisfactorily. Backing this guarantee is a large, thoroughly established and financially powerful concern of nation-wide prestige.

Jaxon Steel Products Company, Dept. C 5, Jackson, Michigan

Here are seven reasons why you tie your truck buyers closer to you when you recommend

JAXON

FULL FLOATING WHEELS



On Exhibit at Boston Show

Cotta Perfects Power Take-Off for Hoist and Winch

A power take-off on the transmission that may be used in connection with a winch or a hoist is part of the standard models of the Cotta jaw-clutch Transmission for trucks. The power take-off can be applied to either side of the transmission, or pneumatic tire pump can be applied in same manner. Thus Cotta gives to the industry another development of the transmission that means greater truck efficiency.

Cotta Transmissions are guaranteed against gear stripping. Speed changes are made through the engagement of jaw-clutches, eliminating entirely gear shifting. Gears are always in mesh—that is why it is impossible to burr gears or strip them. Made in 3 and 4 speeds for trucks and 2 and 3 speeds for tractors. Patented and fully guaranteed. Write for catalog and list of Cotta-equipped trucks and tractors.

Cotta Transmission Company, Rockford, Illinois

"Largest Exclusive Makers of Truck and Tractor Transmissions"

An Assurance of Dependable Service

COTTA
TRUCK AND TRACTOR
TRANSMISSIONS

Gears Always in Mesh

No Other Truck Has These Three Features

PROBABLY the most striking Clydesdale feature is the patented "Driver Under The Hood" which relieves the strain on every part of the truck by automatically regulating the generation of power to meet every change in the "pull."

Prospects are surprised when given a demonstration of this Clydesdale feature. It is hard to make people believe, without actually seeing the "Driver Under the Hood" in operation, that it will take the truck up hill, down hill and through unusual conditions on the level without changing the speed, and without attention of any kind from the driver.

Another feature is the Clydesdale radiator. Constructed of cast aluminum tanks, seamless copper tubes and staunch guard bars, it requires a minimum of repairs under the roughest conditions. Its design insures proper cooling.

A third feature is the appearance of the truck itself. The trim, sturdy construction reflects skillful engineering and carries the conviction that Clydesdale strength and power are equal to any emergency.

These and other outstanding Clydesdale features often influence a sale when a choice is made between Clydesdale and other good trucks.

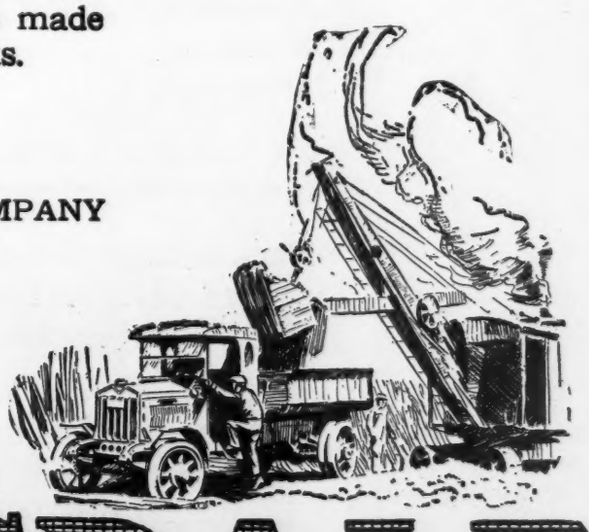
One to Five Tons Net Load

THE CLYDESDALE MOTOR TRUCK COMPANY
CLYDE, OHIO

No Other Truck Has It



"The Driver Under the Hood"



CLYDESDALE

GMC

General Motors Trucks

The Big Message In GMC Truck Success

The clearest and plainest message that can be told to a prospective buyer of GMC Trucks is that GMC Trucks get there and back.

Stripped of fine distinctions in phraseology and mechanical explanations, this is the test of a truck.

Volumes may be written about the machinery of a motor truck, but, after all, what the user wants is to get there and back.

GMC Trucks do just that, which makes long explanations unnecessary.

GMC engineering is just common sense truck building having in view the utmost dependability.

As to GMC quality, that is just plain, honest quality—also common sense.

Back of these things is the stability of the exclusive truck making unit of the General Motors Corporation.

GENERAL MOTORS TRUCK COMPANY

One of the Units of the General Motors Corporation

PONTIAC, MICH., U. S. A.

(628)

PIERCE GOVERNORS



Motor Truck Manufacturers consider Pierce Governors one of their biggest sales assets, because the sole purpose of the Pierce Governor is protection—protection against *speeding*, an abuse that makes the truck owner complain of excessive upkeep cost and causes the truck itself to reach a premature old age.

Pierce Equipped Trucks Are Better Trucks

That explains why 103 motor truck manufacturers have made Pierce Governors standard equipment.

THE PIERCE GOVERNOR COMPANY

"WORLD'S LARGEST GOVERNOR BUILDERS"

ANDERSON, INDIANA



From "Forty-Nine" to Nineteen-Twenty

In the span of a lifetime, caravans of pioneers have pushed civilization into the four corners of the Nation. The mighty streams have been bridged—the mountains conquered. From the campfires of yesterday, great cities—peopled by millions—tower towards the heavens—monuments of the progress of Man.

Three quarters of a century ago, Progress on the Highway was limited by distance. Distance no longer hampers. Motor truck transportation of today, routed over endless highways, pointing in every direction, carry millions of tons annually. Distance is now measured in minutes and hours.

The pioneer and his ox-drawn prairie schooner of '49 have made way for the motor truck dealer with the modern motor truck—the Napoleon of 1920.

Truck dealers have seen the Napoleon stride to supremacy in the 1 and 1½ ton class almost over night. Dealers with vision are placing their orders for all the Napoleon trucks they can get.

If you are the right dealer we can supply you. Write today for full details.

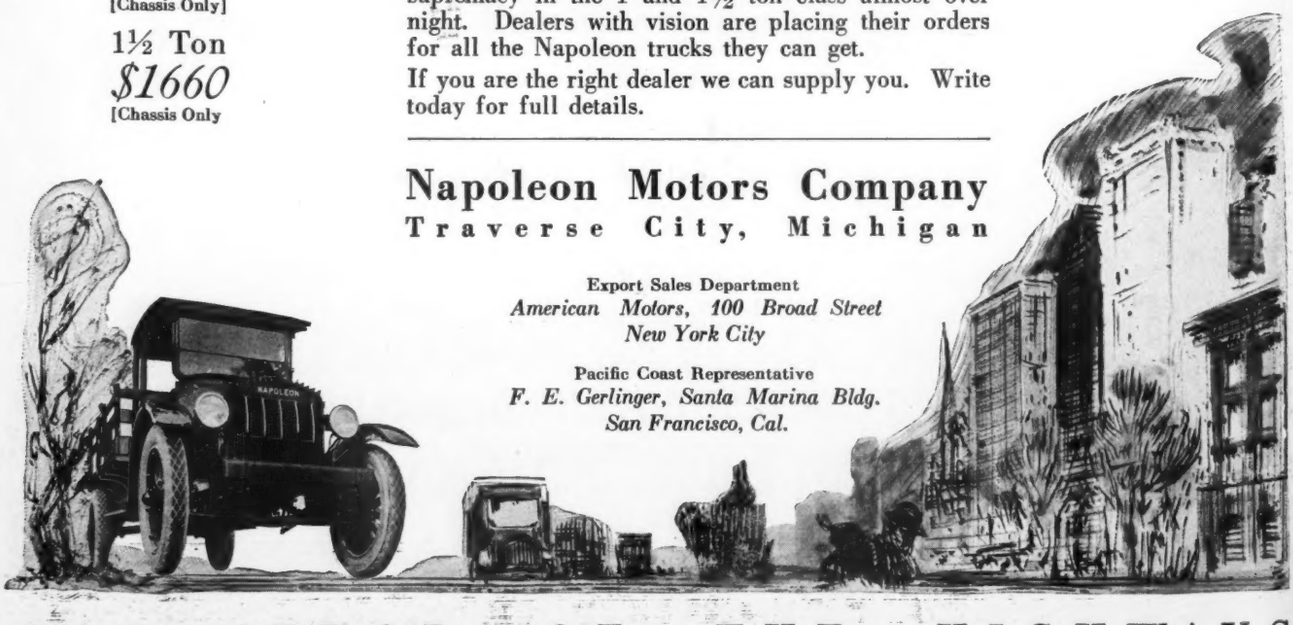
1 Ton
$1360
[Chassis Only]

1½ Ton
$1660
[Chassis Only

Napoleon Motors Company
Traverse City, Michigan

Export Sales Department
American Motors, 100 Broad Street
New York City

Pacific Coast Representative
F. E. Gerlinger, Santa Marina Bldg.
San Francisco, Cal.



CONQUEROR OF THE HIGHWAYS

Proof



—from The New York Journal, Aug. 26, 1919

ITS proved efficiency and dependability in every emergency is the foundation for the great popularity and salability of the

BUELL
EXPLOSION-WHISTLE
WARNS EVERY TIME

Viewed from any angle the Buell is the easiest to sell. Its design and workmanship are the best. The tone is the clearest and it is the only warning signal with such a record of reliability that it can be sold with a 10-year guarantee. Each one sold sells others.

Made in Single Tone and Chime. Stock the Buell for quick, sure profits. See your jobber.

BUELL MANUFACTURING COMPANY

Cottage Grove Avenue at 30th Street Chicago, Ill.

Service MOTOR TRUCKS

Builders of Business

From the Buyer's View Point

In choosing a Motor Truck the purchaser does not wish to experiment. He demands a carrier of proven worth—one that will fit the exact requirements of his business in an efficient, economical manner. On that basis SERVICE Dealers are finding it increasingly less difficult to sell SERVICE Motor Trucks.

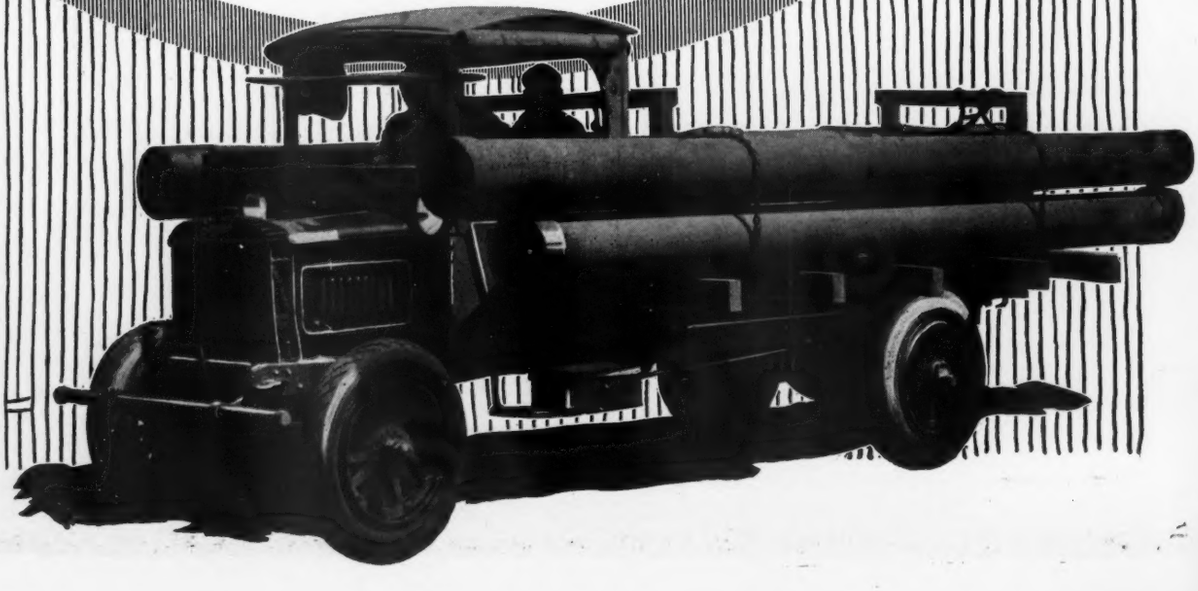
In writing to a prospective dealer, the Service Truck Sales Co., SERVICE distributors, located at Indianapolis, stated as follows:

"We took up the sale of SERVICE Trucks about four years ago. They have proved themselves beyond a doubt in quality and performance, equal to any truck on the market. Seventy-five per cent of our business is repeat business. In the four years we have been handling this line of trucks, we have had nothing but praise for its performance."

If you are interested in selling Motor Trucks of dominant value—write today. Be sure and mention the territory you desire. Seven models from 1 to 5 tons.

Service Motor Truck Co., Wabash, Ind., U. S. A.

NEW YORK—87-89 West End Avenue
CHICAGO—2617-25 So. Wabash Ave.



Speaking of CONCRETE ROADS STREETS and ALLEYS

53,000,000 Square Yards Were Placed Under Contract During 1919—

More than twice the total of any previous year, and equivalent to over 5,000 miles of 18-foot concrete pavement.

Every state—your state—contributed to this wonderful record. Watch 1920!

States in Which Contracts for More than 30 Miles of Concrete Road Were Let During 1919

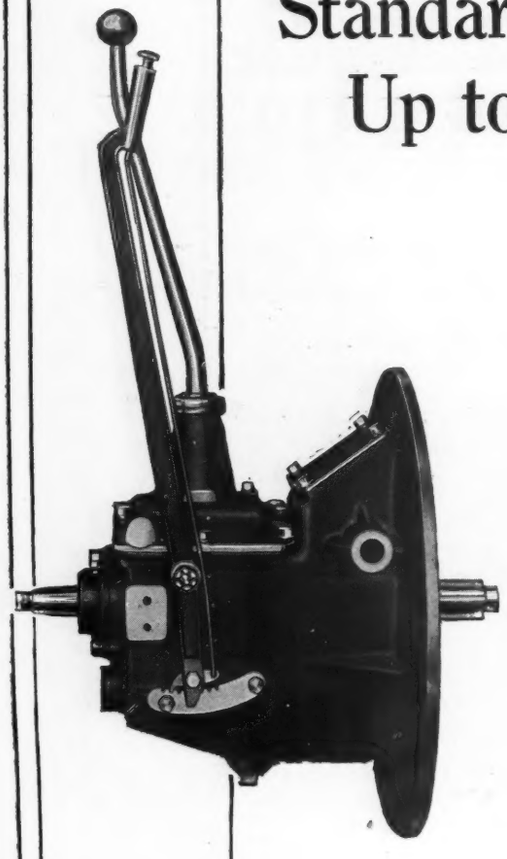
	Miles		Miles
Arkansas	87	New Jersey	87
California	210	New York	329
Delaware	55	Ohio	239
Georgia	90	Oklahoma	69
Illinois	570	Oregon	42
Indiana	280	Pennsylvania	491
Kansas	69	Texas	59
Maryland	95	Utah	84
Massachusetts	31	Virginia	91
Michigan	169	Washington	161
Minnesota	79	West Virginia	87
Mississippi	38	Wisconsin	132

North, east, south and west—
CONCRETE is the choice.

PORTLAND CEMENT ASSOCIATION

Atlanta, Chicago, Dallas, Denver, Des Moines, Detroit, Helena, Indianapolis, Kansas City, Los Angeles, Milwaukee, Minneapolis, New York, Parkersburg, Pittsburgh, Salt Lake City, Seattle, St. Louis, Washington

DURSTON
TRANSMISSIONS



Standard Designs for Trucks Up to 2½ Tons Capacity

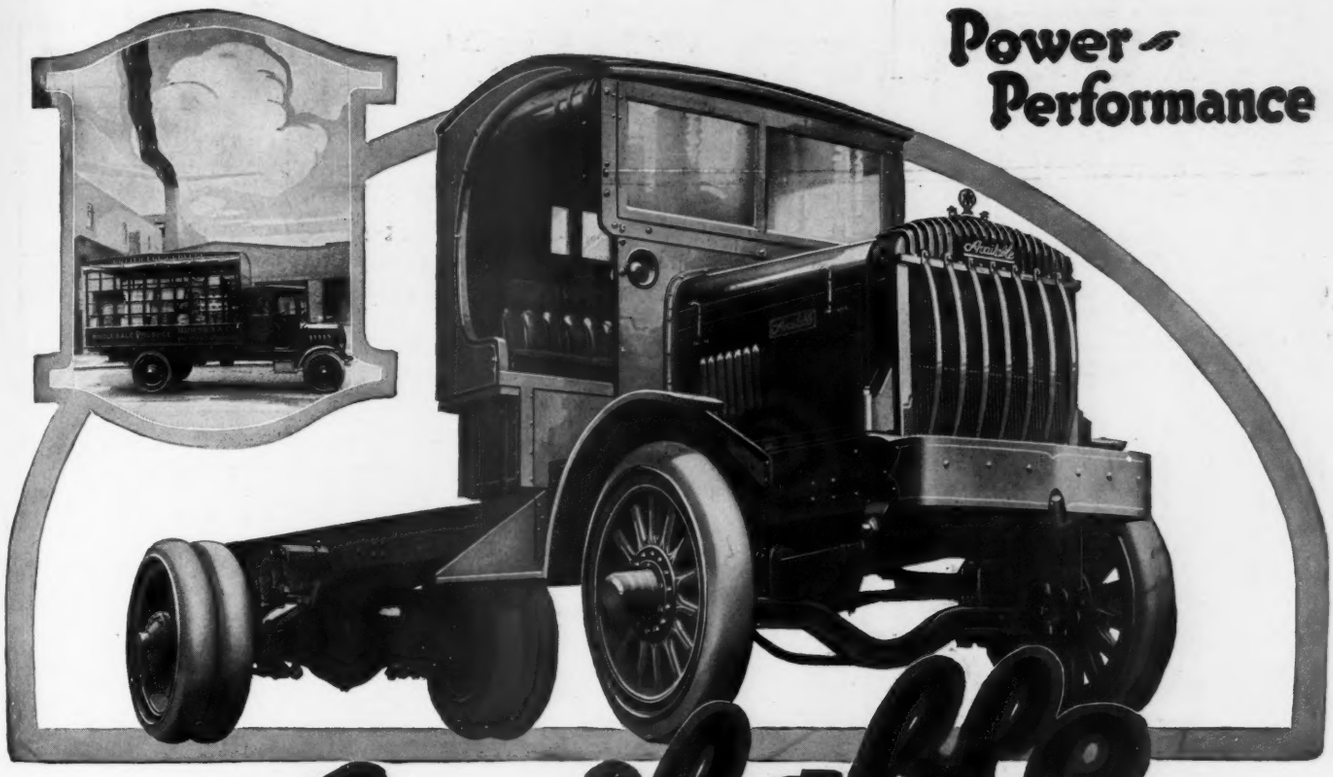
STEWART, who takes pride in the slogan, "No Stewart Truck Has Ever Worn Out," selects Durston Transmissions for lasting reliability.

Many other truck and passenger car manufacturers have used Durston Transmissions continuously with full measure of satisfaction.

Designed by experienced engineers, and built in a thoroughly modern plant under a rigid inspection system, Durston Transmissions embody the latest requirements of construction. They are quiet in operation, easy to shift—important factors in giving satisfaction to users.

DURSTON GEAR CORPORATION
29 MALTBIE STREET SYRACUSE, N. Y.

Ask The Automotive Engineer



Power & Performance

Available Trucks

Feature No. 4



Steering Gear Mounting

A rigid, easily demountable assembly, featured by the splitting of bearing which holds the drop arm shaft. First, remove the drop arm from its shaft, then loosen nuts on shaft bearing, and demounting is complete. Free access is instantly obtained for replacements or removal of steering column.

Solid bolting of shaft bearing through both flange and vertical sections of frame eliminates troublesome looseness found in less rigid assemblies. It is proof against road jars, frame vibration and driver's roughness.

Connection of drop arm and fore-and-aft rod by ball and socket joint permanently binds these important steering members, while positive insurance against failure and accident is effected by accurately taper fitting the drop arm to the shaft.

Write us for detailed information. Address Dept. J.

AVAILABLE TRUCK COMPANY

Kilpatrick and North Avenues Chicago, Ill.

AVAILABLE ALWAYS SINCE NINETEEN TEN

Truck Frames—*plus*

Every motor truck depends for its reputation upon the service it gives.

The Hydraulic Frame makes a definite contribution toward that service by always rendering complete satisfaction, thus enhancing the service-reputation of each motor truck in which it is an integral part.

Every operation of manufacture, from the making and rolling of the steel to the inspection of the completed frame, is under Hydraulic direction and control. This insures the quality of both material and workmanship.



"Equipped with Hydraulic Frame."

Manufacturers of

Pressed Steel Frames for Passenger Cars, Trucks and Tractors; Axle Housings; Brake Drums; Torque Arms; Running Boards; Step Hangers; Hub Flanges; Discs; Dust Shields; Sprockets; Steel Barrels; Aeroplane and Miscellaneous Stampings.

THE HYDRAULIC PRESSED STEEL COMPANY
of THE HYDRAULIC STEEL COMPANY
CLEVELAND, OHIO

Branch Sales Offices:

New York	Chicago	Detroit
Singer Building	Fisher Building	Book Building



"MORE Than a Place to Work"

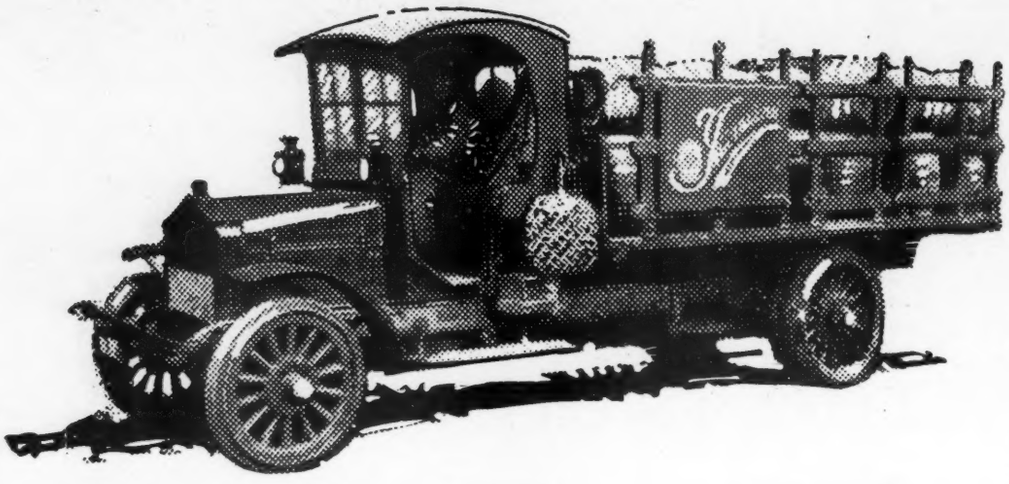
"Self-expression is the right of every individual. It is a vital factor in Hydraulic progress. It signifies the fairness of all Hydraulic policies—of all Hydraulic dealings, both with men in the plants and with customers.

What we market is but the expression of the ideals of all of our men interpreted in product."

HYDRAULIC
PRESSED STEEL COMPANY

A worm drive is the predominant feature of most worth while trucks—and you will find it in the Maxwell.

Maxwell



48 of the First Fifty

Pierce-Arrow trucks are still running after 8 years. Each has cost less than $600 a year depreciation. And their service goes on steadily.

It pays to buy durability. Time is the biggest expense item in truck operation. Durability means operating a long time and all the time.

No. 2 the first Pierce-Arrow truck marketed is used by the International Brewing Company of Buffalo for keg deliveries to neighboring towns.

To demonstrate the worm gear, then new, it ran fully loaded from New York to Boston on May 28th, 1911, in 20 hours. After 7 years' commercial use, it repeated this run in 18 hours and 7 minutes, carrying the same load. Its fame has spread throughout the country.

Pierce Arrow

Delivers more work in a given time.

Loses less time on the job and off the job.

Costs less to operate and less to maintain.

Lasts longer, depreciates less and commands a higher resale price at all times.

THE PIERCE-ARROW MOTOR CAR COMPANY, BUFFALO, N. Y.

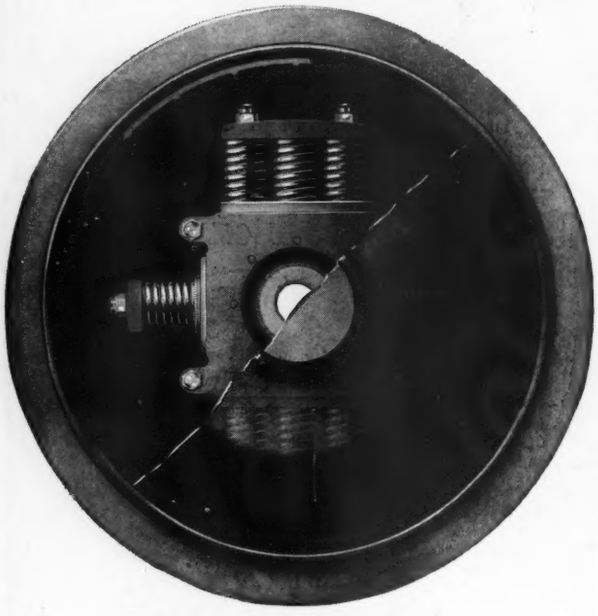
BECAUSE Science was able to bring the application of power a few degrees closer to ultimate efficiency—because engineering skill and large resources attained new standards of accurate production—the name "Torbensen" has acquired a significance in the automotive industry which is expressed in the phrase

Largest Builder in the World of Rear Axles for Motor Trucks



The Cornfield Resilient Wheel

The Sensation of the Truck and Accessory Sections at the Detroit Auto Show



The spring action is on the axle. Springs do not revolve with wheel

Here are some of the comments made by builders and operators of motor trucks when they examined the Cornfield Resilient Wheel at the Detroit Show:

"It will revolutionize the making of truck wheels. Its mechanical construction and engineering principles are so sound that it is sure to be a success everywhere."

One of the best known builders of trucks said: "It is the best truck wheel ever produced. It is far ahead of any other."

"It will overcome the curse of all good motor trucks—vibration."

"It will take the pound off the tires and thereby add hundreds of miles to their usefulness."

Such comments as these *from men who know* trucks, are worthy of consideration by every truck builder and operator.

Cornfield Resilient Wheels for One-Ton Ford Trucks Are Now Being Built in Full Sets for Early Delivery

Cornfield Resilient Wheels stop the pounding on tires and double their mileage.

They give pneumatic results with solid tires.

They cushion the entire truck, and absorb the force of road shocks before that destructive force reaches the chassis and motor.

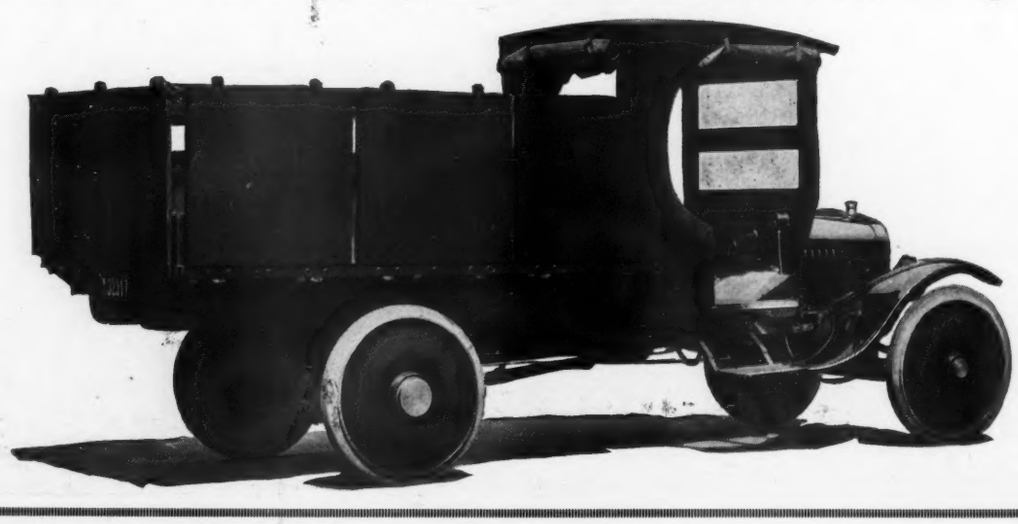
Cornfield Resilient Wheels will keep your truck out of the repair shop.

They will increase its haulage capacity.

The truck shown below has been run 4000 miles without a dollar of expense for repairs, though it carries loads of 3000 to 5000 pounds.

Write for the Cornfield Booklet

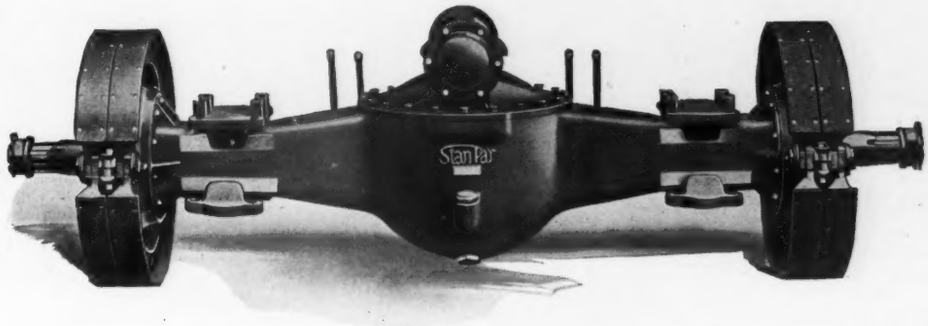
Cornfield Wheel Company, Inc., Anna Place, Detroit, Michigan



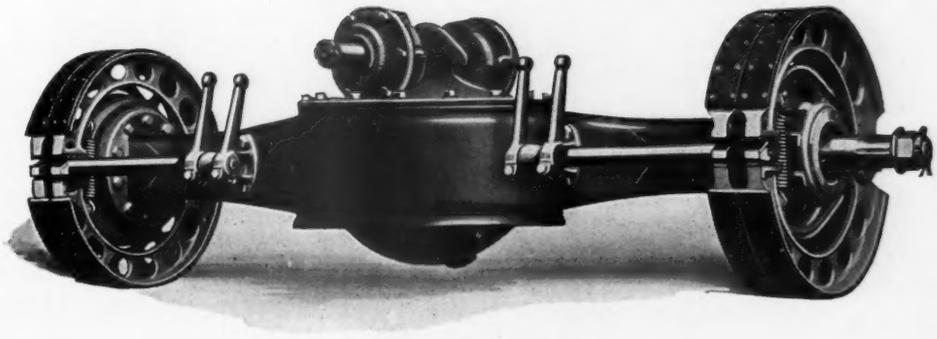
TRADE MARK
Stan-Par
WORM DRIVE
TRUCK AXLES

WELL DESIGNED, WELL MADE—THEY STAY WELL MADE

Front and Rear Axles for 1, 1½, 2, 2½, 3½ and 5 Ton Trucks



Sturdiness, Positive Lubrication



Ease of adjustment, Saving of Weight

Stan-Par Axles are equipped throughout with Bock Taper Roller Bearings

THE STANDARD PARTS COMPANY
AXLE DIVISION CLEVELAND, OHIO

TRADE MARK
Stan-Par
Products

$50,000,000 of Federal Sales



3-2 Ton operated by H. J. Heup, Hales Corners, Wis. Hauling milk



2 Ton operated by Oklahoma Furniture and Mfg Co., Oklahoma City, Okla.



Operated by Mistele Coal and Coke Company Detroit, Mich.



5 Ton operated by Brownell & Field Co., Providence, R.I.



2 Ton Federal operated by Mr. Eastman, San Diego, Cal. Eastman Fruit Co.



This is the sign of the "Tenth Year Federal." A sign significant of ten years of success in every field of truck transportation.



2 Ton with stake body, Columbia Motor Co.



2 Ton operated by Milwaukee Woven Wire Works, Milwaukee, Wis.

The fact that over $50,000,000 has been spent for Federal Trucks during the past ten years speaks plainly of the confidence in which the public holds Federal.

Nothing that we know of could evidence more plainly the present value of a Federal dealer's franchise.

FEDERAL MOTOR TRUCK CO.
DETROIT, MICHIGAN



Cooling Systems embodying Long Spiral Tubing were adopted as standard for War Trucks—they are equal, as well, to all peace time requirements

THE system of automotive radiation that is recognized as *paramount—supreme*—in its vast field; the system that eliminates the hazards, the disappointments, the failures, by placing at the command of the producer, the skilled, experienced, *specialized services of engineers* who study the requirements of *every* motor for *every* purpose. A record of 18 years of unequalled accomplishments is assurance of valuable co-operation.

No engine can be more efficient than its cooling system.

Look to it then that your motor be permitted to realize its maximum of efficiency through the aid of a cooling system engineered to suit its requirements.

LONG MANUFACTURING CO., DETROIT, MICHIGAN

Pioneer Makers of Cooling Systems for Gasoline Engines

LONG

COOLING SYSTEMS

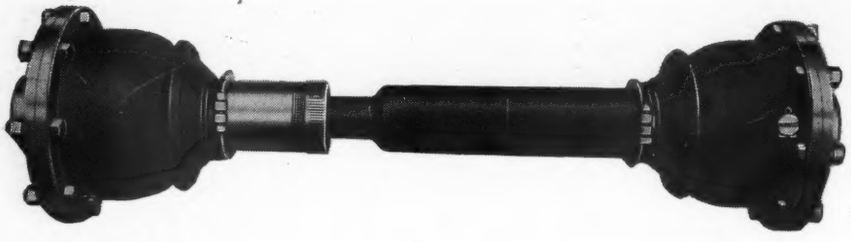
The Recognized Standard for Tractor, Trucks and Motor Cars.

Spicer

UNIVERSAL JOINTS AND PROPELLER SHAFTS

AN extensive advertising campaign in the leading national weeklies is familiarizing the general public with the importance of Spicer Universal Joints and Propeller Shafts.

Thus the Spicer equipment of over one hundred of the leading makes of automobiles and trucks becomes an even more valuable asset to the dealers handling these makes.



SPICER MFG. CORPORATION

South Plainfield New Jersey

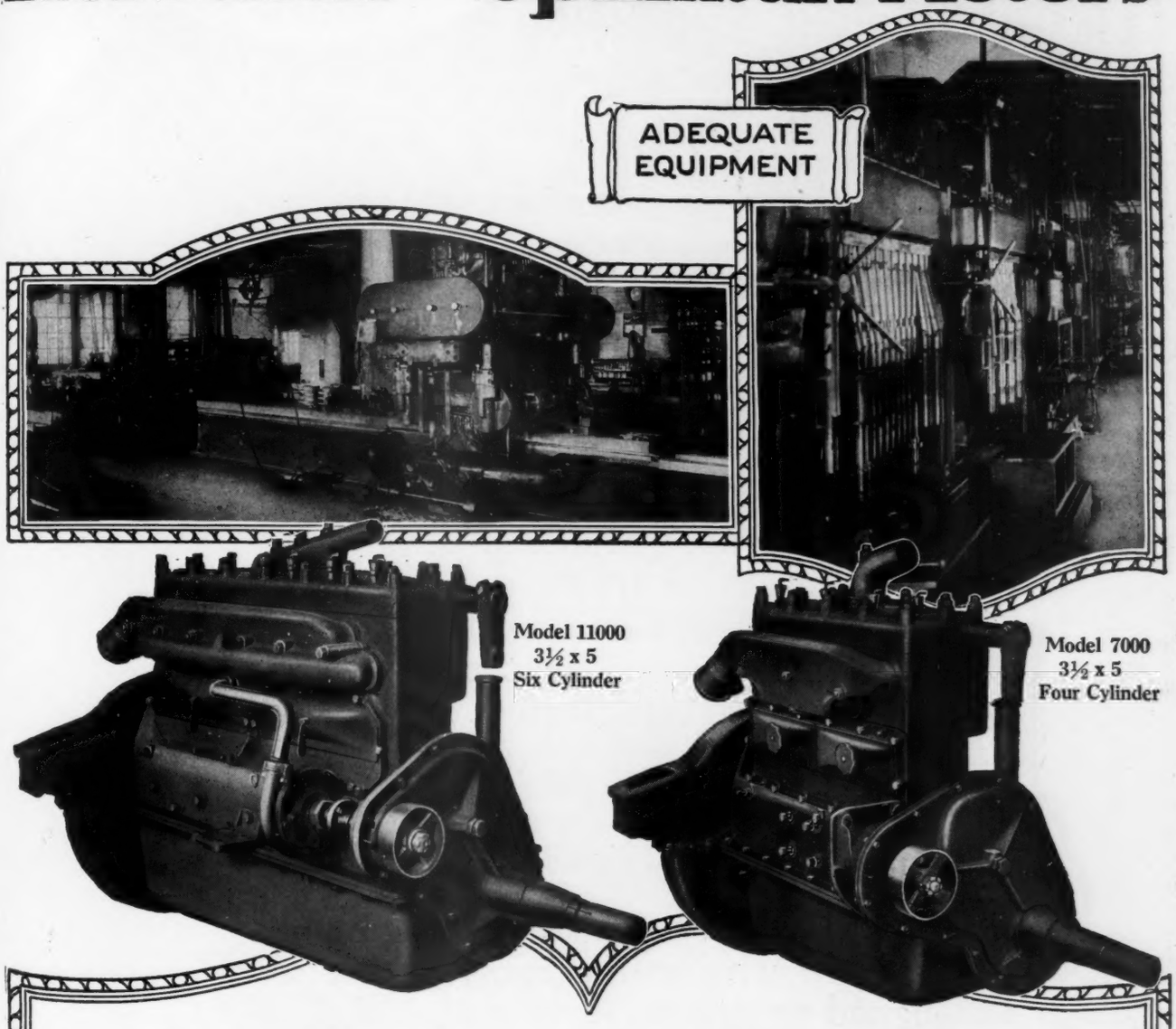
Sales Representatives:

L. D. Bolton, 2215 Dime Savings Bank Bldg., Detroit, Mich.

A. H. Coates, 41 Spear Street, San Francisco, Cal.

Export: Benjamin Whittaker, Ltd., 21 State Street, New York and 56 Ludgate Hill, London, E. C. 4.

Herschell-Spillman Motors



Model 11000
3½ x 5
Six Cylinder

Model 7000
3½ x 5
Four Cylinder

Does This Mean Anything to You?

Special electrically operated machinery—such as illustrated above—affords maximum production and strict adherence to the closest limits.

Couple these qualities with simple, practical design, free from all trappy devices—rigid inspection—thorough testing—experience growing out of twenty years' devotion to the development of gasoline engines of all sizes and types, supported by ample financial resources and capable management, and—

The admitted superiority of the Herschell-Spillman Clover Leaf engines ceases to be a matter subject to speculation.

Herschell-Spillman 3½ x 5, four cylinder and 3½ x 5, six cylinder models are presented to the engineer and trade alike with full knowledge of their ability to perform efficiently. Every automotive vehicle equipped with either of these engines is a warranty of the builders' integrity of purpose and a guarantee of satisfaction to the dealer and the ultimate purchaser. What is more, they are within the limit of all popular priced cars.

Herschell-Spillman Motor Co.

North Tonawanda **New York**

Located eight miles from Buffalo on the lines of the New York Central, Erie and Lackawanna Railroads and Niagara Falls Trolley, affording unsurpassed transportation facilities.

National advertising carries the story of H-S four and six cylinder motors to several million magazine readers each month.

H S MOTORS

"The Pick of the Field"

HAUL IT IN A HALL

Excess Strength Without Excess Weight

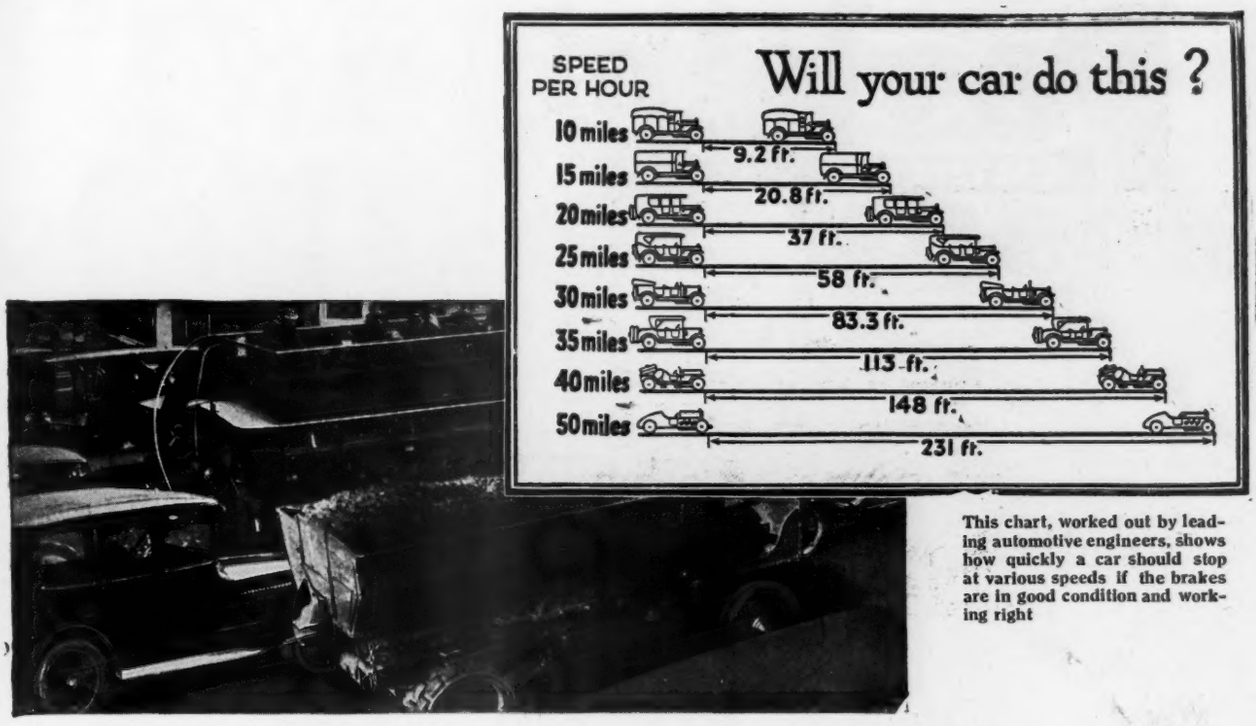
THE higher qualities of performance and service are the result of a rigid code of manufacturing honor established by 46 years' experience in the making of structural steel.

Hall goodness may best be defined briefly as excess strength and power without undue weight.

These two fundamental facts make it plain why traffic experts have assigned to *Hall Trucks* a very definite place in the field of better transportation.

The Lewis-Hall Iron Works
21 Roby Street Detroit, Mich.
"Manufacturers of the Hall Trucks"

As Manufactured by
The LEWIS-HALL IRON WORKS
DETROIT, MICHIGAN.



This chart, worked out by leading automotive engineers, shows how quickly a car should stop at various speeds if the brakes are in good condition and working right

The most serious condition in the automobile industry today

How it presents a new opportunity to build permanent good-will and immediate profits this season

DO you realize the tremendous significance of the rapidly increasing number of automobiles—on the streets of every city—of every town, and even every country road? Do you realize the appalling increase in accidents that is resulting from these crowded highways?

Great Brake Inspection Movement now sweeping the country

Right here is your opportunity. The widespread Brake Inspection Movement opens big possibilities for increased sales—for building good-will—to every progressive dealer and garage owner. Police officials, automotive engineers, town and municipal authorities recognize inefficient brakes as one of the most frequent causes of automobile accidents. These authorities are co-operating to bring about brake inspection—the most practical and efficient means of preventing accidents due to faulty brakes.

Successful dealers and garages are capitalizing this great movement. They are featuring brake inspection to their customers. They are specializing on Thermoid—the brake lining that gives the most in protection from accident—and in actual wear.

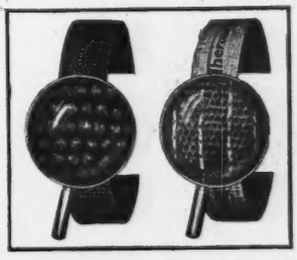
Grapnalized—for longer wear

The asbestos fabric used in the construction of Thermoid Brake Lining is impregnated with *"Grapnal,"* a compound of remarkable wear-resisting and moisture-proof properties. The *"Grapnalized"* fabric is compressed by powerful hydraulic presses into a solid lining of unusual toughness.

These exclusive processes, together with the fact that Thermoid Brake Lining contains *40% more material* by actual weight than ordinary brake lining—makes it the choice of discriminating motorists and experienced mechanics.

Identify yourself with this great movement

Talk brake inspection to your customers. Display the Thermoid Brake Inspection Stopping Chart that proves of unfailing interest to motorists. Send for the Brake Inspection Stopping Chart and the 1920 Thermoid Sales Plan—full of interest to every dealer and garage owner.



Ordinary Woven Lining

Notice the loosely woven texture.

Wears down quickly and unevenly.

Loses its gripping power as it wears.

Thermoid Hydraulic Compressed Brake Lining

Notice the compact texture.

Wears down slowly.

Gives uniform gripping surface until worn wafer-thin.

Thermoid Rubber Company

Factory and Main Offices: Trenton, N. J.

New York Chicago San Francisco Detroit
Cleveland Atlanta Philadelphia Pittsburgh
Boston London Paris Turin

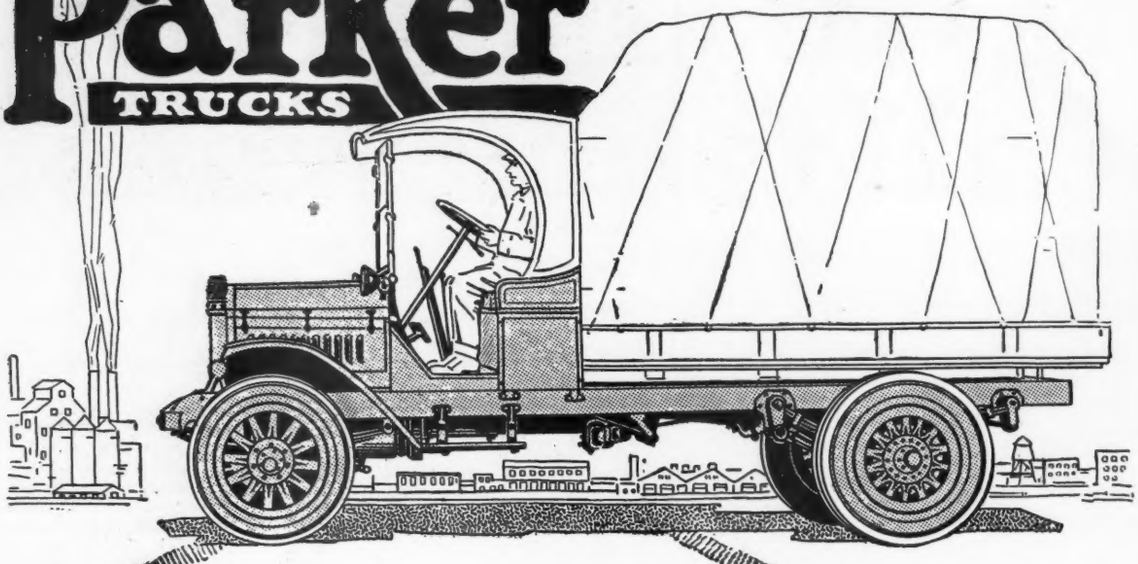
Canadian Distributors:
The Canadian Fairbanks-Morse Co., Limited, Montreal
Branches in all principal Canadian cities

Thermoid Brake Lining

Hydraulic Compressed

Makers of "Thermoid-Hardy Universal Joints" and "Thermoid Crolide Compound Tires"

Parker TRUCKS



Brain and Brawn Built Between Road and Load

THE PARKER stands up and stands out, where other trucks fall down. It is not brightened, and burdened, with truck niceties. It is truck *brain and brawn built* with truck necessities, from the stand-points and strain-points of road and load. And *that* is the *truck-point* to consider.

From its specially selected, road and load, steel construction materials, its "gas" and oil-easy, repair-free, plenty-powerful, war-and-world-famous MILITARY TYPE WISCONSIN MOTOR, step by step to its final plain battle-ship gray finish—THE PARKER TRUCK is the utmost travel and transportation utility and stability on four wheels.

The strong type of business men back of THE PARKER TRUCK *insist* upon this strong type of truck.

Before you invest in new truck cost and the "upkeep package" tied on, learn all about THE PARKER and its road and load advantage features. Your learning will cost nothing that way; but will save money for you.

Write now for details of the 2, 3½ or 5-ton PARKER

DEALERS

It is no trick selling PARKER TRUCKS; there are no tricks to sell. Buyers quickly see PARKER advantages. Write for our 1920 Prosperity Proposition to Dealers.

PARKER MOTOR TRUCK CO.

MILWAUKEE · WISCONSIN · U.S.A.

The lightest of all truck wheels

Wheels are below the springs —hence their weight is unsprung. To move a pound of weight in the wheels requires as great an expenditure of tires, power and fuel as is needed to move ten pounds above the springs.

Dayton Steel Wheels, according to their size, are as much as 100 pounds lighter per set than other types of wheels—in no case are they heavier.

These wheels are also resilient, strong, durable and economical. They are the wheels that should be on your trucks.

Write for our bulletins and folders

The Dayton Steel Foundry Co.
Main Office and Works
Dayton, Ohio



Cross section showing the hollow rim and spoke construction of the Dayton Steel Wheel. This provides lightness and strength. It also reduces the unsprung weight and adds to carrying capacity

Dayton WHEELS

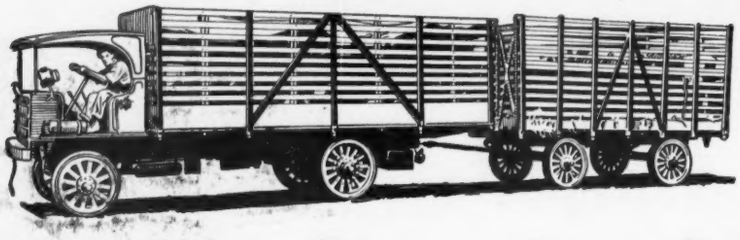
(C) T. D. S. F. Co.

Dayton
Steel Truck Wheels
(PATENTED)

DETROIT: *702 Penobscot Bldg.*
LOS ANGELES: *3769 Moneta Ave.*
CINCINNATI: *416 First Nat'l Bank Bldg.*

Trailmobile

Trade-Mark Reg. U. S. Patent Office



Profitable Quantity Sales



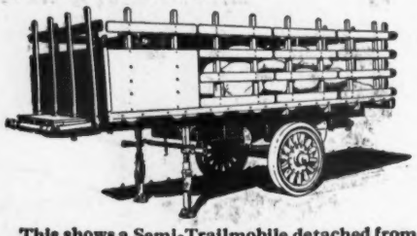
Light four-wheeled Trailmobiles of 1,250 lbs., ¾-ton and 1-ton capacities are used with passenger cars or light trucks.



Heavy duty four-wheeled Trailmobiles for use behind trucks of the usual wheel-base are made in 1½-tons, one-way; 2 tons, 3½-tons and 5-tons reversible and one-way.



This is the Semi-Trailmobile with Fifth-wheel which makes coupling automatic. It is drawn by a short wheel-base truck.



This shows a Semi-Trailmobile detached from the short wheel-base truck ready for loading or unloading in the absence of the truck. Semi-Trailmobiles are offered in 2½-ton, 4-ton, 6-ton and 10-ton sizes.



Pole Trailmobiles for logs, poles, pipes and loads of great length are made with adjustable chock blocks, length compensating springs, and other important mechanical features in 2 ton, 3 and 5 ton capacities. In each case the truck carries an equal load.

THERE are sales in quantity to be made in selling Trailmobiles. Firms who have vast amounts of hauling to do in the cities are standardizing on semi-trailer hauling and fleets of as many as 150 are now in operation.

Every business uses some one of the several types of Trailmobiles—manufacturers, lumber producers and distributors, bottlers, farmers, and scores of other businesses have taken them up because they have found that they can haul twice as much at substantially the same cost when they use a Trailmobile behind their trucks.

The demand is here for all types of Trailers and as the illustrations suggest The Trailmobile Company makes a complete line. It provides a mechanically right trailer for every hauling use under every hauling condition.

The profit margin is the same as on the most desirable trucks. *And that profit is exceptionally clean as there is practically no service required after the sale.* The Trailmobile is so sturdy and so simple it is not necessary to carry repairs.

Investment in stock is small as it is the Trailmobile policy to ask dealers to buy no more than they can move readily.

And the Trailmobile dealer is able to meet requirements for practically any type of trailer that a purchaser may need or desire.

A great many Trailmobiles are going to be sold in your territory and at a good profit. If the line is not now represented there write now for literature and the dealer's proposition.

The Trailmobile Company

502-522 E. Fifth Street **Cincinnati, Ohio**

Good roads are preserved by reducing the load carried on each wheel



"We Cannot Praise Maccar Trucks too Highly"

NEW YORK OFFICE
83 GOLD STREET
Phone, 207 Beekman

Brooklyn Phone
998 East New York

ERHART BROS.
EXPRESS VANS PUBLIC TRUCKMEN
580-582 LIBERTY AVENUE

Brooklyn, N. Y., Aug. 9, 1919.

Pitts Motor Car Co.,
540 Atlantic Ave.,
Brooklyn, N. Y.

Dear Sirs:-

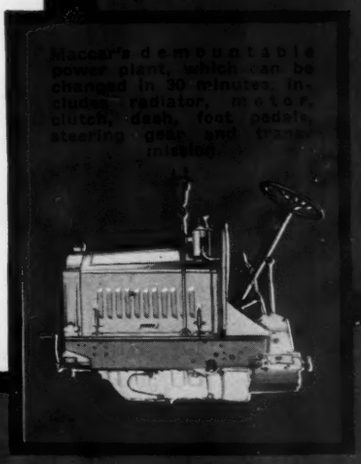
We are very pleased to state, in answer to your inquiry as to what we think of the Maccar Trucks, that we now have six of these trucks purchased over a period of five years.

Our first truck was purchased in April, 1915, a 2½ ton, and is still running strong. In April, 1916, we purchased a 1½ ton; in January, 1917, a 3½ ton; in July, 1917, a 5 ton, and another 5 ton in December, 1918. Our last purchase being a 5 ton Dump Truck, May, 1919.

We feel that this record in itself is a satisfactory recommendation for the Maccar Truck. We cannot praise these trucks too highly, nor the excellent service which the Pitts Motor Car Company has rendered us.

Yours for success,

ERHART BROTHERS.
Per A. Erhart
President.



MACCAR TRUCK CO.
Scranton, Pa.

"the truck of continuous service"

Maccar


EXTREMELY ECONOMICAL
Speed and Haulage Power
THE New Stromberg Carburetor, on any truck, develops power of pull and power of speed essential to delivery of full-capacity loads in the least possible time, at the lowest fraction of fuel cost.
Its unfailing efficient operation and decided economy are in strict keeping with present-day demands of heavy production and elimination of waste.
Full particulars on request
State name and year of truck
The Stromberg Motor Devices Co.
Dept. 336 64 E. 25th St. Chicago, Ill.
New STROMBERG Does it!
CARBURETOR

Martin-Parry
Commercial Bodies



This Martin Panel Body, No. 454 A, is in quantity production at our York, Penna. Plant. Prompt shipments can be made if you order early.

A Handsome Panel Body *for the* Ford Truck Chassis

It makes an excellent body for all lines of business which demand speedy, economical, dependable delivery service with complete protection of the goods.

Designed especially for light hauling—skillfully built with a hardwood frame and handsomely finished straight side "Vehisote" panels—this body truly makes a worthy companion of the reliable Ford Chassis.

The rounded front roof and oval windows on each side of driver add much to its appearance. The double rear doors, equipped with a patented anti-rattler fastener, provide an opening 44 inches wide, 54 inches high. Inside length of body, measured from back of driver's seat, is 96 inches.

Merchants in every community are in the market right now for high-grade delivery bodies. The Martin-Parry line includes commercial bodies for every business, in sizes for every chassis.

Sell these bodies. Make quick sales and increase your profits. Complete specifications and dealer's price lists sent on request.

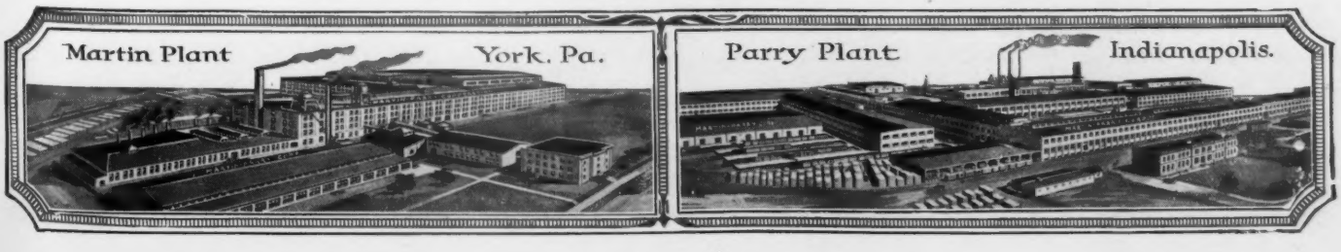
Martin-Parry Corporation

The Largest Commercial Body Builders in the World

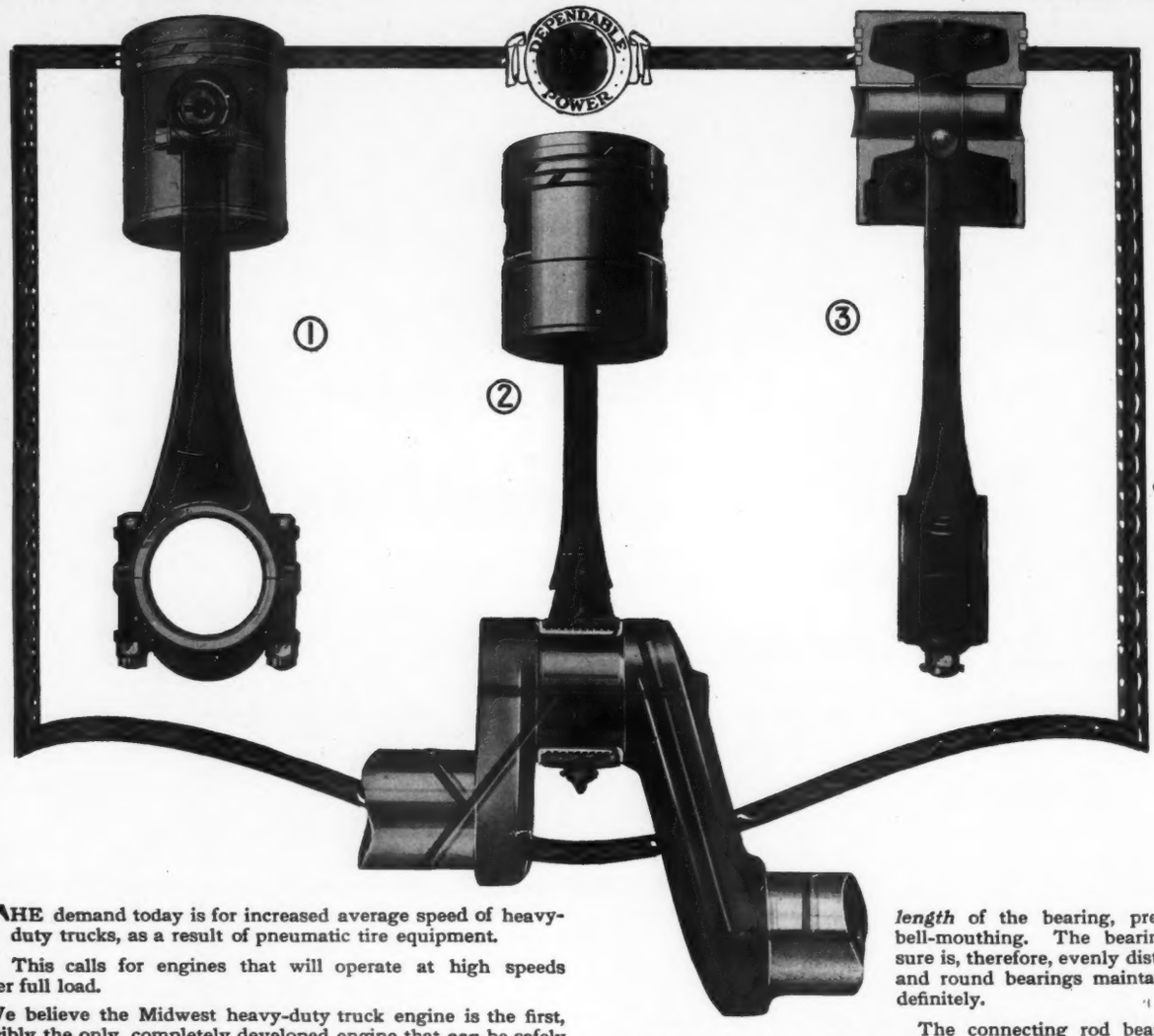
York, Penna. —*Main Offices and Factories*— **Indianapolis**

Distributing Points

Boston	Martin-Parry Corp.	Kansas City	Henry Seested	Richmond, Va.	Benj. T. Crump Co.
Buffalo	Martin-Parry Corp.	Memphis	Lilly Carriage Co.	St. Louis	Bailey Auto Body Sales Co.
Chicago	Martin-Parry Corp.	Milwaukee	Wis. Body & Sales Co.	San Francisco	Flynn & Collins
Denver	Auto Equipment Co.	Minneapolis	Northwest Body Co.	Seattle	Commercial Body Co.
Detroit	School-Gracey Body Co.	Oklahoma City	H. N. Knight Sup. Co.	Spokane	Universal Auto Co.
El Paso	Tri State Access. Corp.	Pittsburgh	Pitts. Com. Body Co.		



MIDWEST
TRUCK *and* TRACTOR ENGINE



THE demand today is for increased average speed of heavy-duty trucks, as a result of pneumatic tire equipment.

This calls for engines that will operate at high speeds under full load.

We believe the Midwest heavy-duty truck engine is the first, possibly the only, completely developed engine that *can* be safely operated under full load up to 1500 R.P.M. and is guaranteed under such conditions.

The above illustrations graphically tell how the design of the Midwest engine enables it to perform satisfactorily at high engine speeds.

All the bearings on the 3″ whip-proof crankshaft are floated on a film of oil. The oil pressure is maintained according to the *load on*, rather than *speed of*, the engine by an automatic relief valve on the front bearing. The oil travels under pressure to the bearings, forming a film of oil at the moment of minimum pressure—not at the moment of maximum bearing pressure.

The connecting rod (Fig. 1) supports the full *width* of the bearing down to the center and the ribbed cap does the same on the lower half. The connecting rod (Fig. 3) also supports the full *length* of the bearing, preventing bell-mouthing. The bearing pressure is, therefore, evenly distributed, and round bearings maintained indefinitely.

The connecting rod bearing oil-film (Fig. 2) is formed just before the impulse stroke of the engine. As no shims or grooves are used, the oil must pencil, or spiral, into a film, floating the bearings continuously.

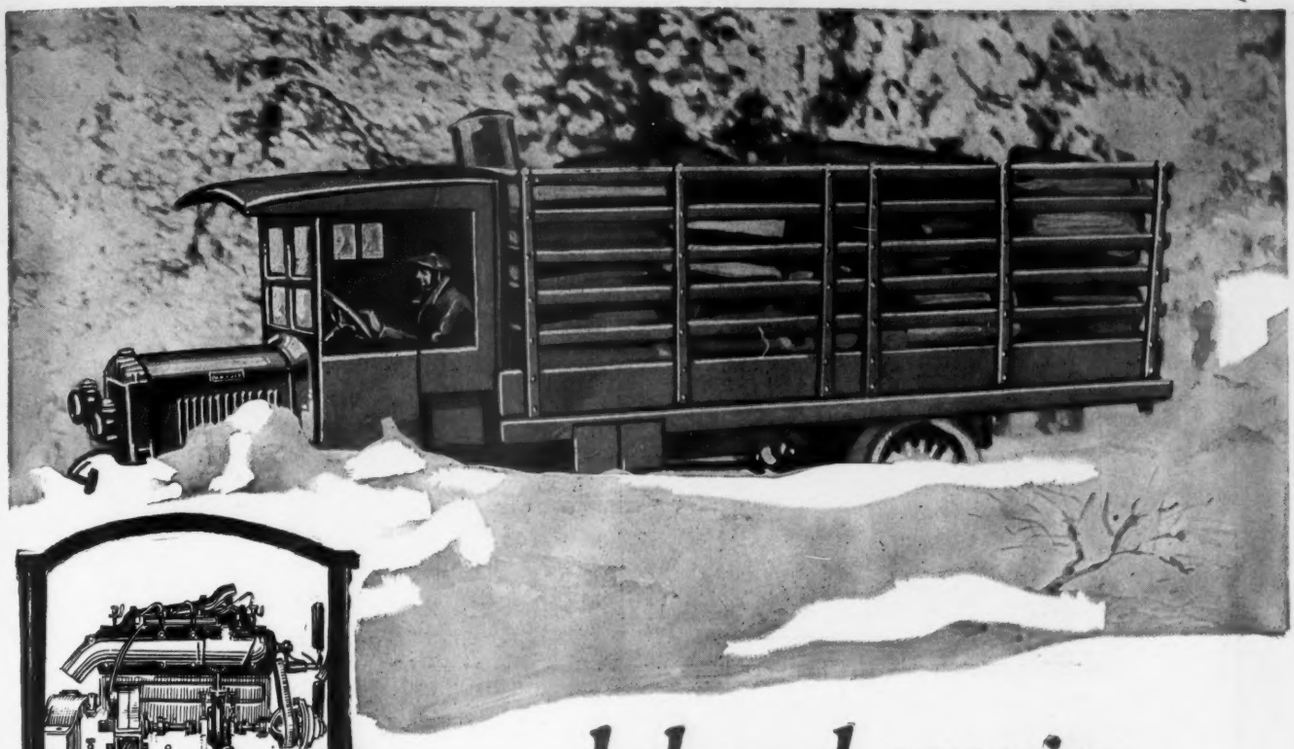
The pictures above clearly depict the liberal bearing area of the wrist pin, which is positively locked in the connecting rod. This construction prevents wrist pin moving endwise and scoring cylinders.

This unique construction of connecting rod and bearing is typically Midwest, and is one of the reasons why the Midwest heavy-duty truck engine is able to perform satisfactorily under present day, high speed, transportation requirements.

Complete information as to the general construction of the Midwest engine sent on request. Please address Sales Division 13.

THE MIDWEST ENGINE CO., Indianapolis, U. S. A.

Dependable Power



The Master Motor
is the heavy duty Buda—the world's finest Truck Motor. It is an oversize motor in every size Master—in oversized balance to every other part of Master construction. It is this "stronger than necessary" factor that brings the Master through every road emergency.

balanced oversize
makes Master Trucks masters in snowbound Washington

YAKIMA, Washington, needed fuel. It was dead of Winter. The snow lay three feet deep. The nearest wood supply was at Rimrock, 47 miles away. Experts said no team or truck could reach it.

But two 2-ton Master Trucks of the Valley Transfer Company tore open the drifted road—made twenty-one round trips—each with three full cords of wood. Up and down the snow-bound hills the Masters ploughed, making each trip within ten hours. Never once did the Masters falter. Not once did they double or tow, even on the steepest grades.

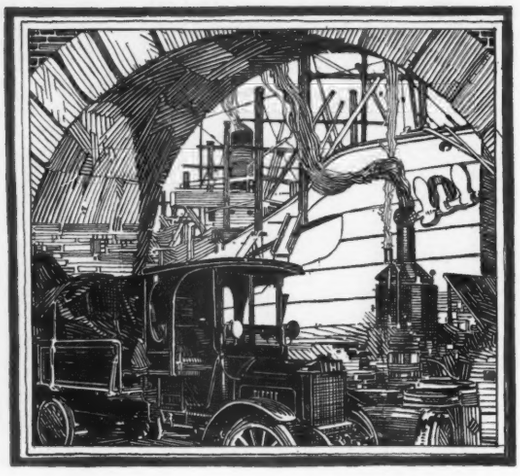
Others later followed in the Master's path—other trucks, carrying smaller loads, taking from two to five days to make the trip. Some failed even to get through at all in the Master-broken trail.

The Valley Transfer Company of North Yakima, Wash., is proud of its Master Trucks. It has written a letter telling us so. It is still another tribute to Master construction, to Master stamina, to ***balanced oversize.***

MASTER TRUCKS, Inc.
3132-3138 S. Wabash Ave., Chicago

MASTER TRUCKS

MASTER OF THE LOAD ON ANY ROAD



MULTIBESTOS is factory equipment on FEDERAL trucks

THE use of MULTIBESTOS brake lining as factory equipment on 60% of American motor trucks and motor cars is your best guide when relining brakes.

In buying and using MULTIBESTOS you are certain that its service and wear have won the endorsement of those best qualified to judge brake lining under every condition of service.

Follow the overwhelming choice of America's automotive engineers who have every facility for analyses and tests—*reline with* MULTIBESTOS.

MULTIBESTOS COMPANY
Walpole, Mass., U. S. A.

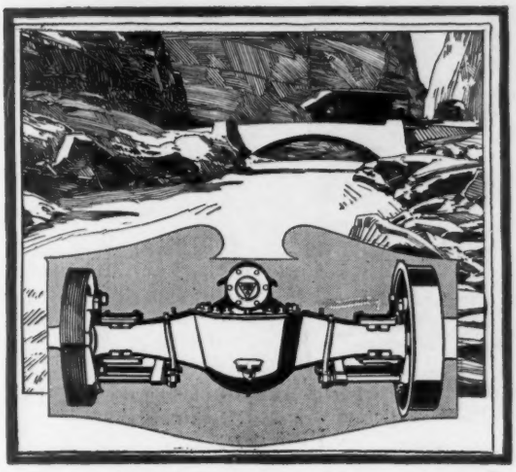
Chicago
1430 Michigan Avenue

Chattanooga
8th and Broad Streets

San Francisco
1159 Post Street



MULTIBESTOS is factory equipment on TIMKEN AXLES



MULTIBESTOS BRAKE LINING

is factory equipment on these trucks, tractors and axles

TRUCKS

Acason
Acme
Armleder
Atco (American Truck & Trailer Co.)
Atterbury
Autohorse
Available
Brockway
Clydesdale
Collier
Concord
Conestoga
Dart
D-E (Day Elder)
Dependable
Diamond T
Dixie
Dodge
Dorris
Fageol
Federal
Ford
Fulton
Gabriel
Garford
Giant
G-M-C
Hahn
Hall
Hendrickson
Hewitt-Ludlow
Hupmobile
Kalamazoo
Kelly-Springfield
Kissel Freighter
Kleiber
Maccar
Master
Maxwell
Menominee
Moreland
Mutual
O-K (Oklahoma)
Oneida
Packard
Parker
Pierce-Arrow
Rainier
Selden
Seneca
Service
Signal
Standard
Sterling
Studebaker
Sullivan
Tiffin
Tower
U. S.
Velie
Watson
Wilcox

TRACTORS

Avery
Bailor
Boring
Dauch
Emerson-Brantingham
G-O
Hart-Parr
Illinois Super Drive
Indiana
Massey-Harris
Monarch
National
Parrett
Samson
Waterloo Boy

AXLES

Liggett
Peru
Russel
Salisbury
Standard
Timken
Torbensen
Wisconsin

MOTOR-CYCLES

Excelsior
Harley-Davidson

In addition Multibestos is equipment on 60% of American passenger cars

BRAKE LINING

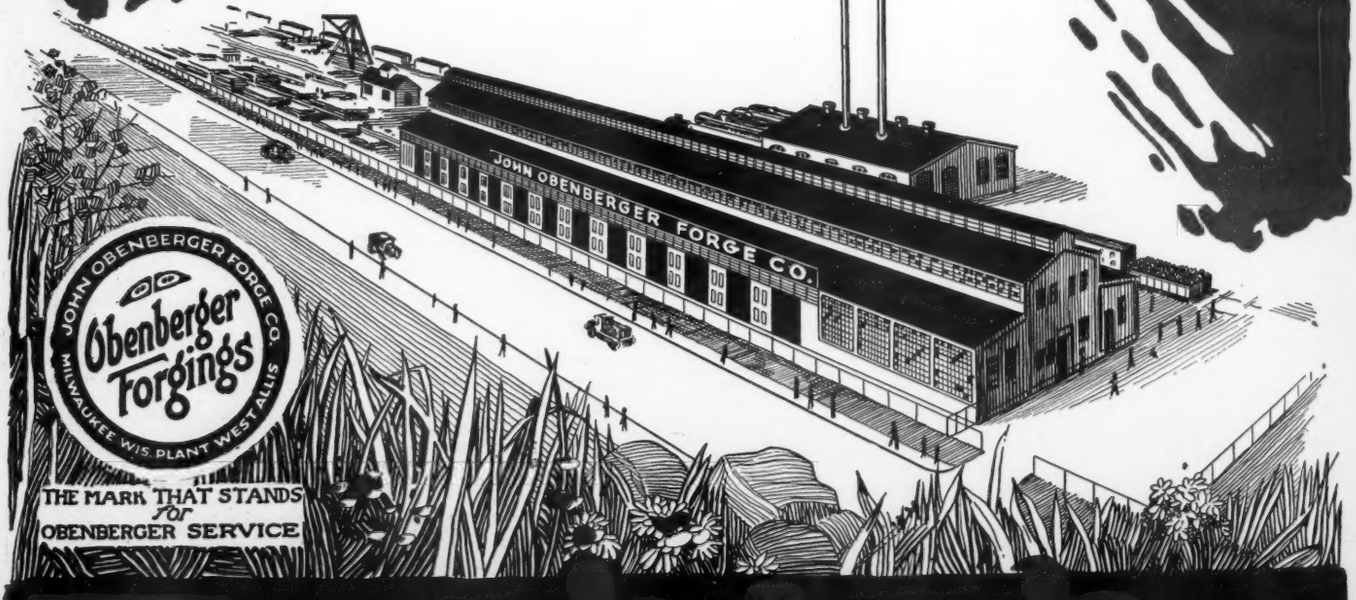
Obenberger Forgings

Obenberger Forgings will satisfactorily meet the requirements of truck, tractor and automobile makers in Drop Forgings or Forgings Hammered from Billets.

Buyers of Obenberger Forgings stay with us because the quality is high, the service prompt and the price reasonable.

Try Us on Your Job

John Obenberger Forge Co.
West Allis Wisconsin
"Specialists on Forgings for Truck, Tractor, Automobile and Engine Forgings"



Forgings

"Horse Sense"



Men with "horse sense" know that overloading a motor truck is like overloading their stomachs—both are distressing and neither habit is profitable.

What was probably the first theatre party to "ship by truck" was made up recently at Easton, Pa., for attending a matinee performance in New York. Twenty-eight women composed the party. The truck had been converted into an enclosed "carry-all" capable of seating thirty persons. The trip each way, a distance of seventy-eight miles, was made in a little more than four hours. It was so successful that another trip from Easton has been planned, and several nearby towns are planning community "ship-by-truck" theatre parties for the near future.

The City Council of Glasgow, Scotland, adopted the Traffic Truck after British, Continental and many American makes of trucks had been demonstrated and examined—"that means something"—the Scots are careful buyers.

The Traffic is the lowest priced 4,000-lb. capacity truck in the world. Built of standardized units.

Traffic Specifications:

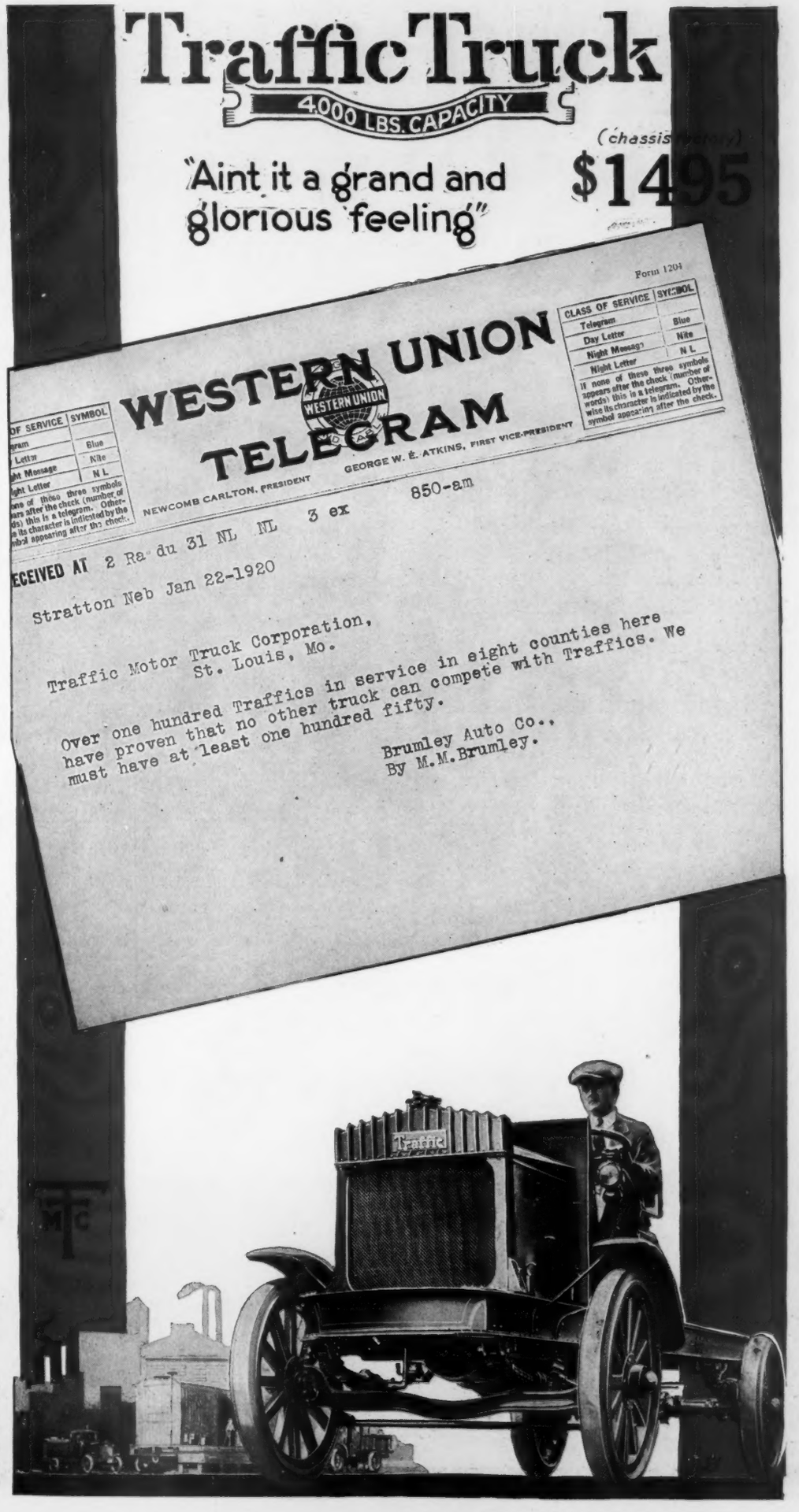
Red Seal Continental 3¾ x 5 motor; ***Covert transmission;*** multiple disc clutch; ***Bosch magneto; Carter carburetor;*** 4-piece cast shell, cellular type radiator; drop forged front axle with ***Timken roller bearings; Russel rear axle,*** internal gear, roller bearings; semi-elliptic front and rear springs; ***6-inch U-channel frame; Standard Fisk tires, 34 x 3½ front, 34 x 5 rear; 133-inch wheelbase; 122-inch length of frame behind driver's seat;*** oil cup lubricating system; chassis painted, striped and varnished; driver's lazy-back seat and cushion regular equipment. Pneumatic cord tire equipment at extra cost.

Chassis $1495 Factory

Traffic Truck chassis equipped with cab, hoist, steel dump body (painted and varnished), *no extras required,* $1990 complete.

Notice to Dealers

It is Traffic policy to make direct connections in every city, town and village throughout the United States. Wire for territory you want and if open come to the factory and see the Traffic produced and perform.



GENUINE NEW TIMKEN BEARINGS

The bearings you obtain from a Branch or Authorized Distributor of this Company are genuine and new because the Bearings Service Company acts as the service department of the Timken Roller Bearing Co., Hyatt Roller Bearing Co. and New Departure Manufacturing Co.

The service is official.

Each Branch maintains complete stocks of genuine, new Timken, Hyatt and New Departure Bearings, for repairs and replacements.

Through our service you may obtain bearings for any make of motor car, truck or tractor ever manufactured. No matter where you are located there is a Branch or Authorized Distributor in or near your city.

The service is nation-wide.

BEARINGS SERVICE COMPANY

General Offices: **Detroit, Michigan**

Branches in the Following 27 Cities:

Atlanta	New York	Rochester	Fresno
Boston	Seattle	Oakland, Cal.	Portland Ore.
Chicago	Kansas City	Philadelphia	Toronto
Detroit	Dallas	St. Louis	Brooklyn
Los Angeles	Cleveland	New Orleans	Milwaukee
Minneapolis	Denver	Pittsburgh	Salt Lake City
San Francisco	Indianapolis	Omaha	

More than 1,000 Authorized Distributors in Other Main Centers


BEARINGS
SERVICE
COMPANY

Exclusive Agencies a Fixed Policy of This Great Akron Tire Success



Two pages of the Friendship series — now appearing in The Saturday Evening Post.

Sales of The General Tire have doubled every year since it has been sold—six great buildings have been added to its factories since 1915—and in spite of that increased space, they have been running 24 hours a day for the last three years. Is there another such tire success that still offers its distributors exclusive and uncompetitive sales territories? Is there any other tire so well known, nationally, that maintains the absolute independence of the agents who have helped make it successful?

The General Tire distributors will always own their own territories as long as they want them—and they will always want them as long as The General factory maintains the foresight that made The General one of the first successful Cord Tires—that produced The General Jumbo Tire to win the 30 x 3½ field as an over-size specially priced tire for small cars — that anticipated the trend of truck equipment towards pneumatics, which made The General Cord a real Truck Tire—and that makes only one complete line of tires and accessories under one name only and sold by only one distributor in each territory. Those are the policies which, coupled with the best tires that the best tire town in the world can make and broad-gauge National and Local publicity, have assembled the most loyal array of tire distributors under the protection of The General Shield that any tire company — with or without factory branches — has ever succeeded in securing. The General Tire goes a long way to make friends — and its factory policies go as long a way to keep them.

The General Tire and Rubber Co.
Akron, Ohio



THE GENERAL
CORD TRUCK TIRE

—goes a long way to make friends

ZENITH



A revised edition of this instructive and valuable book on Carburetion is now ready. *A copy will be sent on request.*

ZENITH CARBURETOR COMPANY

New York **DETROIT** **Chicago**



Immediate

Today we are so thoroughly and soundly organized, and so ably supported by a producing plant that we not only can take care of our established dealers but can also arrange for a few unsold territories and make immediate deliveries.

Ace advertising began last August. Excepting a demonstrator and a Test Machine, Ace Trucks were then a promise.

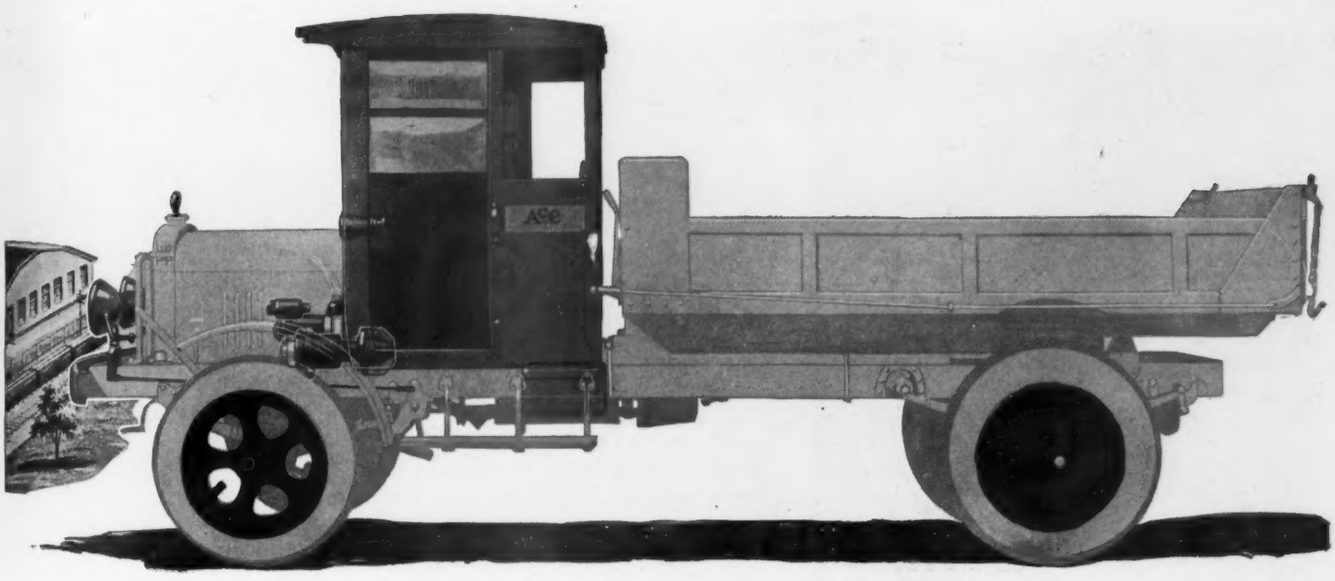
Within a few weeks, Ace Distributors and Dealers were signed up and made their deposits on as many Trucks as we could produce.

The first of November we were sold out for eighteen months on the factory production at that time.

By January first we had added new Distributors and Dealers and increased our factory output.

A Truck Franchise is no good unless you can get Trucks to sell.
Ace Trucks are ready in 1½ Ton and 2½ Ton capacities.

Other sizes ready soon.



The First Complete Motor Truck

About three years ago the tendencies of Motor Truck service pointed beyond the unfinished frame or chassis toward the completely finished Truck ready for load, road and driver. Our Engineers were the first to design and build such a Truck. War emergencies prevented Ace Trucks from reaching the market two years ago. With the completion of our war contracts, we moved at once into Ace production. The acceptance of the Ace idea was immediate and conclusive.

Delivery

The Dealer Must Be Paid

The Truck Dealer is a necessary link in the Selling chain. As such he has a right to a good income. These facts are recognized in the Ace Selling Agreement, which is as far ahead of ordinary contracts as Ace Trucks are ahead of ordinary Trucks. Ace Contracts involve good Trucks, at good prices, with good discounts for good dealers who deserve good incomes as a reward for good work.

The Ace Contract is Different

The Ace Selling Agreement was designed new—from the ground up. It puts Truck Sales on a business basis. It cuts out the speculation. It adds power to every effort the Dealer makes. It recognizes the Dealer as a partner in the promotion plan, insures his position, pays him well, protects his territory, and offers him suitable rewards for good work. It also provides a service and repair parts business on a new plan.

Ace

The AMERICAN MOTOR TRUCK COMPANY
NEWARK OHIO.

THE AMERICAN MOTOR TRUCK COMPANY, Newark, Ohio

Now I'm ready to talk Ace Contract

Name _____

No. _____ Street City _____ State _____ C.C.J.-Mar.

Specialized Cord Tires

MADE in a factory designed solely for the manufacture of cord tires. Built by experienced cord tire builders under the direct personal supervision of cord tire specialists. Made with one tread scientifically designed to give unusual ease in steering and riding, yet a maximum of safety from skidding.

To do one thing and do that thing better than it has been done before is the idea back of SYRA-CORD TIRES. You will not realize how this idea has been materialized until you have tested out for yourself on actual road service your first SYRA-CORD.

Dealers: Good things go quickly. Better wire or write today!

SYRACUSE RUBBER COMPANY, *Inc.*
SYRACUSE, NEW YORK



BUILT BY CORD TIRE SPECIALISTS

Undivided Control of Operations

FROM the making of the raw steel to the shipment of the finished product, undivided control of operations gives complete coördination of manufacture both as regards the quality and volume of production of

SRB

Single Row Double Row

ANNULAR BALL BEARINGS

The Braeburn Steel Mill, pioneer in tool steel products, with its immediately adjacent coal supply and its own gas wells, affords a source of Electric Furnace Bearing Steel equally reliable for highest attainable quality and constancy of supply.

Subsequent mechanical processes are balanced and coördinated up to the last operation, so that the many times multiplied demand for S. R. B. Bearings is being met with a production that would be impossible with facilities one degree less complete.

This expansion of manufacture is under conditions that assure full maintenance and even further refinement of the quality which has made S. R. B. Bearings standard equipment for those automobiles, trucks and tractors whose names are instantly thought of as leaders in their respective fields.

STANDARD STEEL AND BEARINGS Incorporated

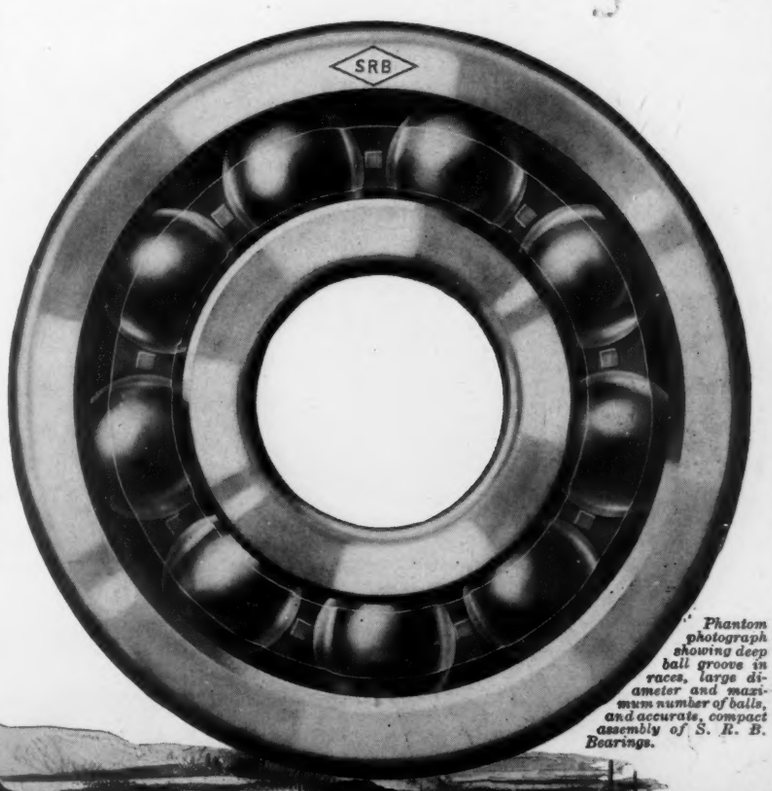
Philadelphia
Standard Roller Bearing Co.
Plainville, Conn.

Pittsburgh
Braeburn Steel Co.
Norwich, Conn. New Haven, Conn.

Standard Sales and Service Distributors in Principal Cities

Controlled and Operated by
MARLIN-ROCKWELL CORPORATION

Executive Offices:
347 MADISON AVE., NEW YORK



Phantom photograph showing deep ball groove in races, large diameter and maximum number of balls, and accurate, compact assembly of S. R. B. Bearings.





Standard Steel Wheels are obtainable for both solid and pneumatic tires and are delivered completely machined ready to install.

"STANDARDIZE" is the word that is circulating among truck manufacturers. It means "Equip with Standard Steel Wheels because you are sure of the wheels—both in quality and quantity."

To the truck manufacturer who has learned the difference between placing an order and getting the goods the immense plant of this company is a conclusive argument. It is both the largest and the only exclusive steel wheel foundry in America—and it was designed and built for making Standard Steel Wheels only. No other product comes out of it.

Experience has proved that only by the closest specialization can steel wheels be manufactured efficiently.

To the truck owner the large output of Standard Steel wheels is also important. Among steel wheels only the fittest survive. Large scale production and widespread use eliminate the experimental and quickly establish the superiority of simple, sturdy, scientific design.

This is why truck buyers have already indicated a decided preference for Standard Steel Wheels.

THE STANDARD STEEL CASTINGS CO.
General Sales Offices, 910 Michigan Blvd., Chicago
Plants at Cleveland and Chicago

STANDARD STEEL WHEELS



A New Basis of Profitable Truck Selling

When 85% of the owners of a certain truck say they bought that truck because of several pronounced features, the trade is given a definite basis upon which to figure sales and profits. This is true in the case of the Acme—you know in advance the quality of the truck you are selling and the kind of service it will render.

Over 850 out of every 1000 owners of Acme Trucks, investigation shows, bought because of Acme Proved Units and Acme Proved Construction—and the number of owners who will add Acmes to their fleets shows an amazingly high percentage.

The industry's leading units as selected and assembled by Acme engineers give positive assurance of complete satisfaction in service and performance. Over 990 out of every 1000 owners of Acmes in service say it is superior to any other truck because of this proved construction.

Acme dealers have known standards upon which to build an increasing and profitable truck business. They have facts which make the Acme franchise one of the most desirable of the times. Write for details on our proposition. Some undeveloped territory still awaits the right dealer.

Acme Trucks Are Built in 1, 1½, 2, 3½ and 5 Ton Models. Also Acme-Built Bodies, Enabling Us to Ship Trucks Ready for Service

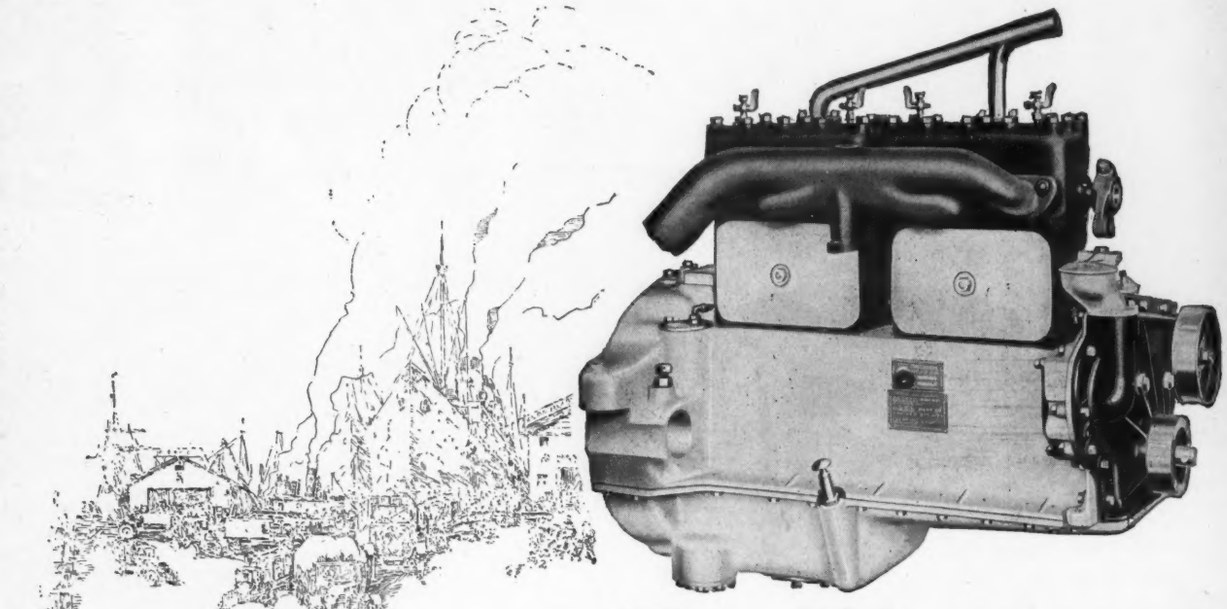
Acme Motor Truck Company

225 Mitchell St., Cadillac, Mich.

The Seal of Dependable Performance

ACME
THE TRUCK OF PROVED UNITS

Trade-Mark Registered in U. S. and Foreign Countries



The Obligation of Supremacy

In an organization that has maintained a position of pre-eminence in motor building for nearly two decades, there is a well-defined OBLIGATION to go on and on—forever striving for the realization of the ideals upon which that position was founded.

The Continental Motor that is produced *today*, therefore, must of necessity live up to the performance of those hundreds of thousands of motors that are now in use in motor vehicles everywhere.

And as an acknowledgment of that obligation to the truck builder, dealer and owner — each Continental Motor carries on its crank case the Red Seal.

CONTINENTAL MOTORS CORPORATION

Offices: Detroit, Michigan Factories: Detroit — Muskegon

Largest Exclusive Motor Manufacturers in the World

CONTINENTAL MOTORS — Powerful as the Nation — AMERICA'S STANDARD

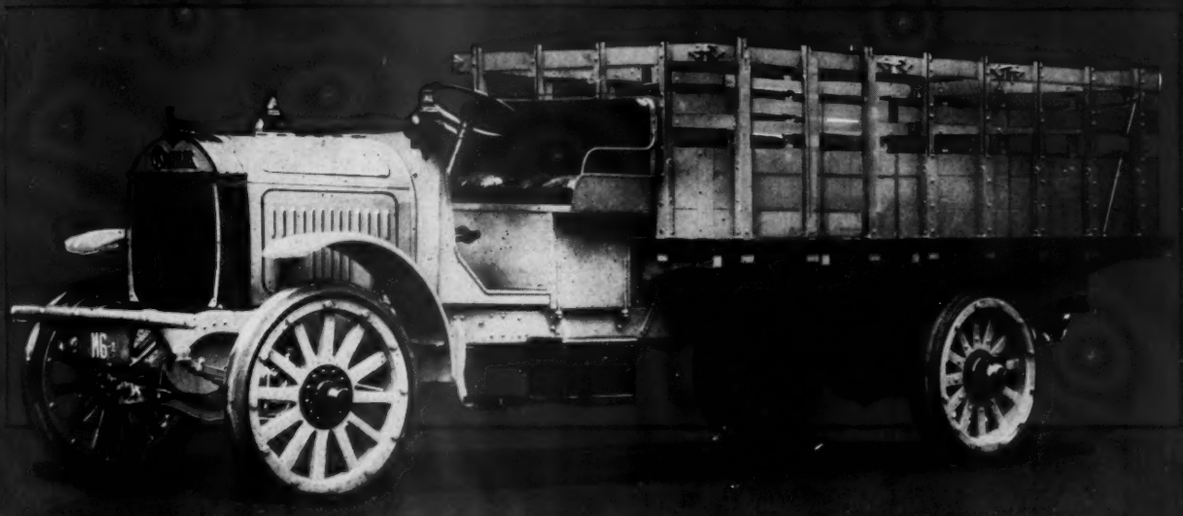
Continental Motors

STANDARD POWER FOR TRUCKS, AUTOMOBILES AND TRACTORS

KOEHLER

TRADE MARK REG.

Trucks and Road Tractors



Sell KOEHLER Transportation

Some otherwise keen motor truck dealers are trying to sell collections of special features—when they ought to be selling TRANSPORTATION. There's a big difference.

Nothing against special features. We have a lot of them, and they all help. But what the truck buyer wants—and demands—is steady, day-in-and-day-out ability to handle the loads, to get there and back unfailingly with economy of upkeep and operation. And that is TRANSPORTATION.

The NEW KOEHLER Line

of trucks and road tractors builds business for dealers on the basis of proven reliability in action—SURE TRANSPORTATION.

Koehler dealers do not have to argue that this or that special feature accounts for Koehler strength, sureness, economy and durability. They simply demonstrate that Koehlers invariably DO THE WORK. When the results are delivered, high-quality construction can safely be taken for granted.

The whole Koehler line is new. Its serviceability is new. The results being obtained by the reorganized staff behind it are new;

and the opportunities it offers to DEALERS are NEW

Write Today for Our Liberal Agency Proposition and Full Details on the Salability of the New Koehler Line

H. J. KOEHLER MOTORS CORPORATION
156 Ogden Street, Newark, N. J.

The NEW KOEHLER Line

Model C, $1985
1¼ ton truck Chassis

Model M, $3365
2½ ton truck Chassis

Model MT, $3450
5 ton road tractor Chassis

Some Koehler Points of Merit

Model M has Koehler-Hercules 5-bearing crankshaft motor with Tungsten steel valves; Fahrig metal and Non-Gran bronze bearings; positive pressure oiling; Lavine steering; Brown-Lipe transmission and clutch; Timken-Detroit worm-drive rear axle; built-up, heavily armored radiator; Chrome Vanadium steel springs, heat treated and tempered; two-piece propeller shaft supported at center universal joint in SKF self-aligning, annular ball bearing.

A score of other features equally indicative of high quality and reliability.

K

The HUFFMAN TRUCK

The "Self-Seller" of the Truck Field

The Huffman Truck solves nearly 200 kinds of hauling problems. Solves them satisfactorily and cheaply, too. Carrying capacity, 2000 to 5500 lbs., including body weight. Look at the specifications and you'll see why. Then look again at the price and you'll understand why we say the Huffman is a "self-seller."

GENERAL SPECIFICATIONS

MOTOR—Model B 4-cyl. Continental Red Seal.
MOTOR—Model C 4-cyl. Buda.
IGNITION—Dixie High-Tension Magneto.
CARBURETOR—Zenith.
CLUTCH—Fuller, dry disc type.
TRANSMISSION—Fuller, Unit Power Plant Type.
STEERING GEAR—Lavine Irreversible.
FRAME—Hydraulic Pressed-Steel Channel.
FRONT AXLE—Drop Forging with Timken Bearings.
REAR AXLE—Torbensen Internal Gear or Standard Worm Drive.
SPRINGS—Perfection—Special Design.
TIRES—Firestone.
WHEELBASE—140 inches.
LOADING SPACE—10½ ft. from rear of seat to end of frame.
CHASSIS WEIGHT—3200 lbs.

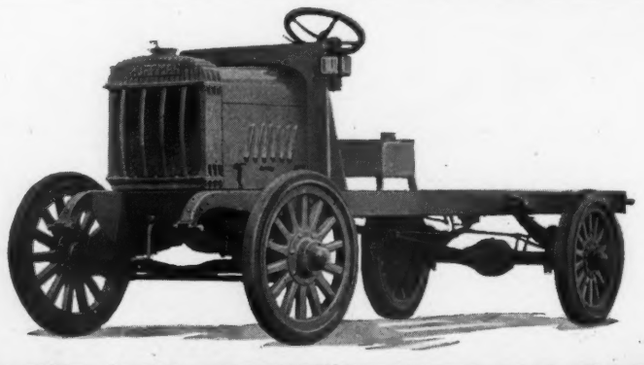
Write for our dealer plan—we are in the truck business to stay and to help our dealers build up Huffman sales. We want the dealer with the "pep" to work with a "live-wire" organization. If you are that man, "call Western Union" right away. We are on the job to show you.

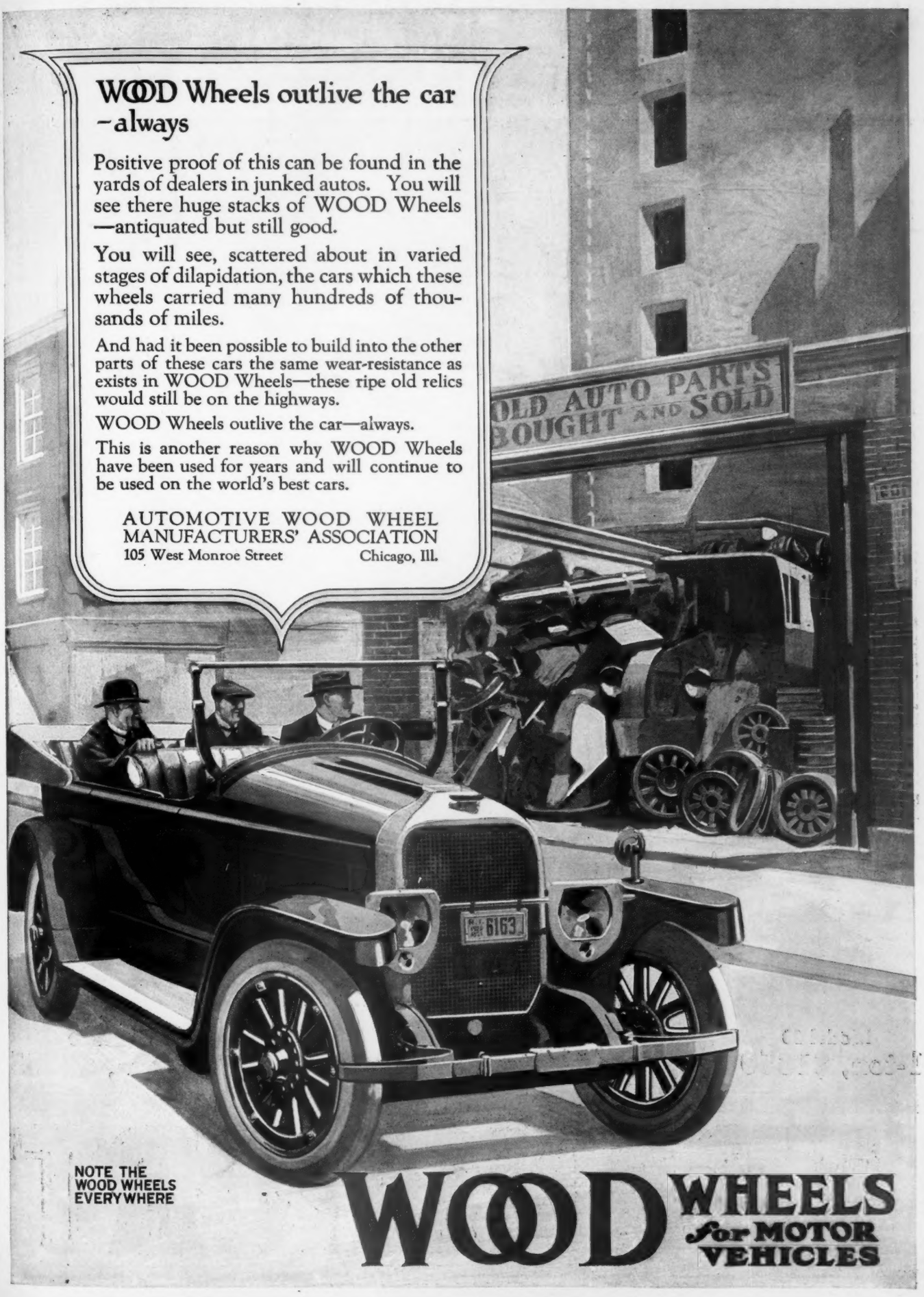
Huffman Brothers Motor Co.

Main Office and Factory: Elkhart, Ind.

Branch and Showroom:
2425 Michigan Ave. Chicago, Ill.

CHASSIS PRICE $1695





WOOD Wheels outlive the car —always

Positive proof of this can be found in the yards of dealers in junked autos. You will see there huge stacks of WOOD Wheels —antiquated but still good.

You will see, scattered about in varied stages of dilapidation, the cars which these wheels carried many hundreds of thousands of miles.

And had it been possible to build into the other parts of these cars the same wear-resistance as exists in WOOD Wheels—these ripe old relics would still be on the highways.

WOOD Wheels outlive the car—always.

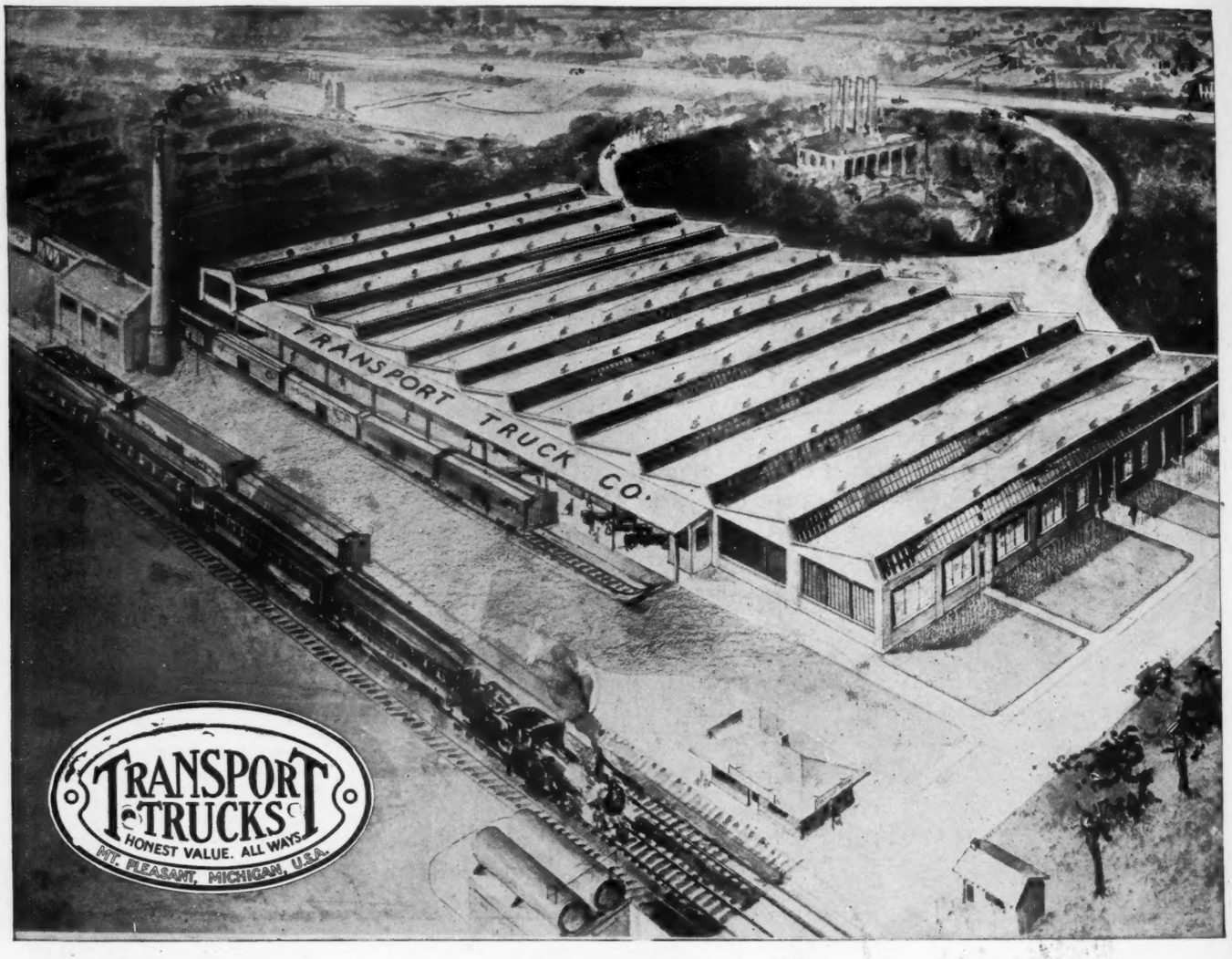
This is another reason why WOOD Wheels have been used for years and will continue to be used on the world's best cars.

AUTOMOTIVE WOOD WHEEL MANUFACTURERS' ASSOCIATION
105 West Monroe Street Chicago, Ill.

NOTE THE WOOD WHEELS EVERYWHERE

WOOD WHEELS for MOTOR VEHICLES

Transport Demand Calls



THE Transport Truck Factory at Mt. Pleasant, Mich., built in 1919, is one of the finest examples of plants built exclusively for truck production. With its own heat-treating equipment, and the latest machinery for truck manufacture at the command of the best engineering ability, this institution (the Transport Truck Company) has produced the Frictionless Truck.

Model 20
1-ton, $1850

Model 30
1½-ton, $2250

Model 50
2½-ton, $2785

TRANSPORT

for TRIPLE the Output

THE phenomenal success of Transport is due to the most rigid standard of truck inspection yet adopted.

No Transport Truck leaves the factory until it tests to the *utmost accuracy* of measurement and balance possible to truck building science.

It is performance based on this principle that necessitates the tripling of the Transport factory's capacity.

Transport Truck Company

Mt. Pleasant, Michigan

Honest Value All Ways



Internal Gear Drive TRUCKS

The Gill Man Says



"I Put Myself in the Place of the Buyer"

Why do so many buyers select Gill Piston Rings?

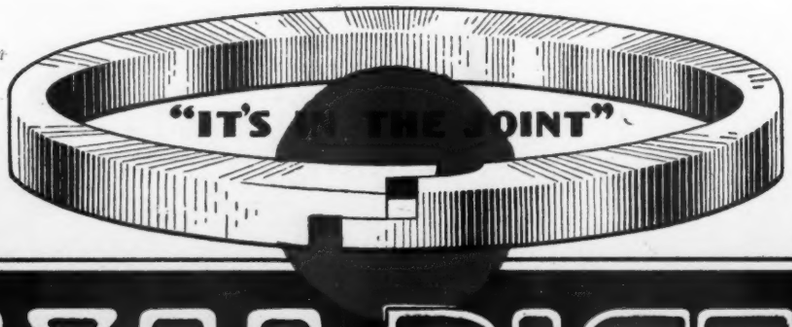
There's a question of real interest to you. Here's why! Gill Piston Rings enable high-powered heavy-duty motor trucks to perform evenly without the slightest loss of power. With the tendency to overload, this is a big factor toward the efficient operation of thousands of motor trucks.

Keen buyers who have based their decision as to the best piston ring obtainable for truck motor operation on competitive performance, have chosen Gill Rings every time.

Get acquainted with its simple, one-piece construction. Mechanics and service men chortle with glee when replacements are made with these easily applied rings. And once in place, the famous Gill Joint forms a seal that prevents loss of compression.

Equip your Motor Truck with Gill Piston Rings and secure more power at once. Sold by jobbers everywhere.

The GILL Mfg. Co.



Jeffery Avenue
and 83rd Street
Chicago, Ill.

SOLE FOREIGN AGENTS
Automotive Products Corp.
Woolworth Bldg. New York

Gill PISTON RINGS

HAWKEYE
MOTOR TRUCKS

Hawkeye Trucks have more *load-carrying strength!*
Hawkeye Trucks have more *load-moving power!*
There you have the reasons why truck transportation *is* more efficient and economical with the Hawkeye.

We use the best type of internal gear drive rear axle. The load is carried by a *solid forging* of steel which has no other duty than *load carrying*. The load is *moved* by a driving member which does not share the carrying burden.

That is why Hawkeye Trucks have more load-carrying strength and greater load-moving power.

Every unit in Hawkeye Trucks is designed for unusual loads and unusual roads.

Make Every Road a Right of Way

Mud, sand hills—they never stop a Hawkeye. Hawkeye Trucks make every road a right of way.

Write for details of our dealer proposition

HAWKEYE TRUCK COMPANY

R. A. Bennett, President **2701 Floyd Avenue, SIOUX CITY, IOWA**



The LYCOMING MOTOR

LYCOMING FOUNDRY & MACHINE COMPANY

This Guarantee is the Truck Buyer's Protection Against Motor Trouble



Any truck buyer, regardless of his lack of knowledge of technical details, realizes that the motor is the most vital part. As the source of power he can comprehend its vital function and appreciate how little his investment is worth if the motor is poorly constructed or lacks power.

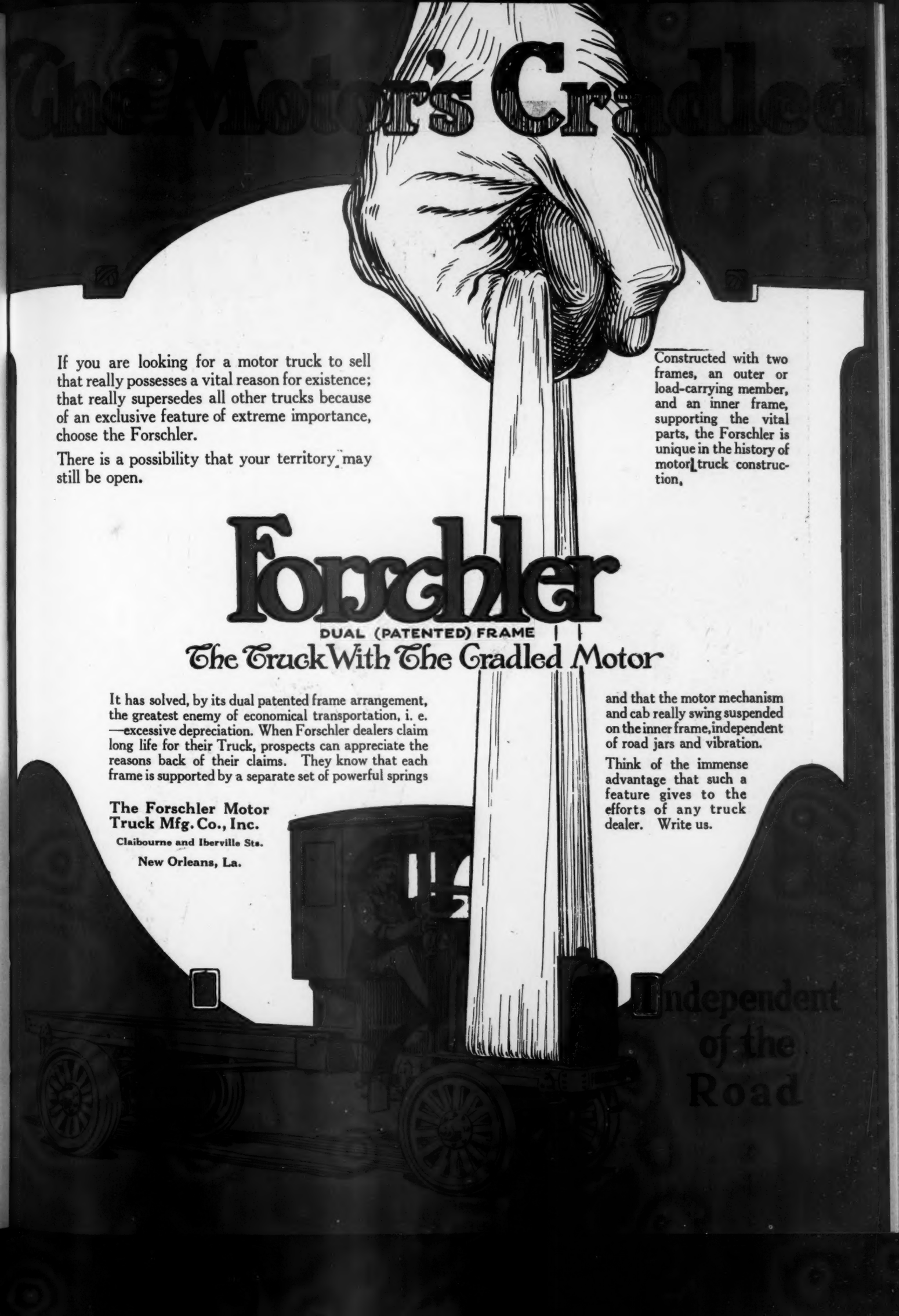
Therefore, it is wise to assume that at least 50 per cent of a dealer's selling argument can be concentrated in selling the buyer on the motor. When a prospect asks what motor your truck contains, and you can reply, "It's the long-lived Lycoming," you have a distinct sales asset. Then follow this up with these facts that will open his eyes as to the relative merits of motors.

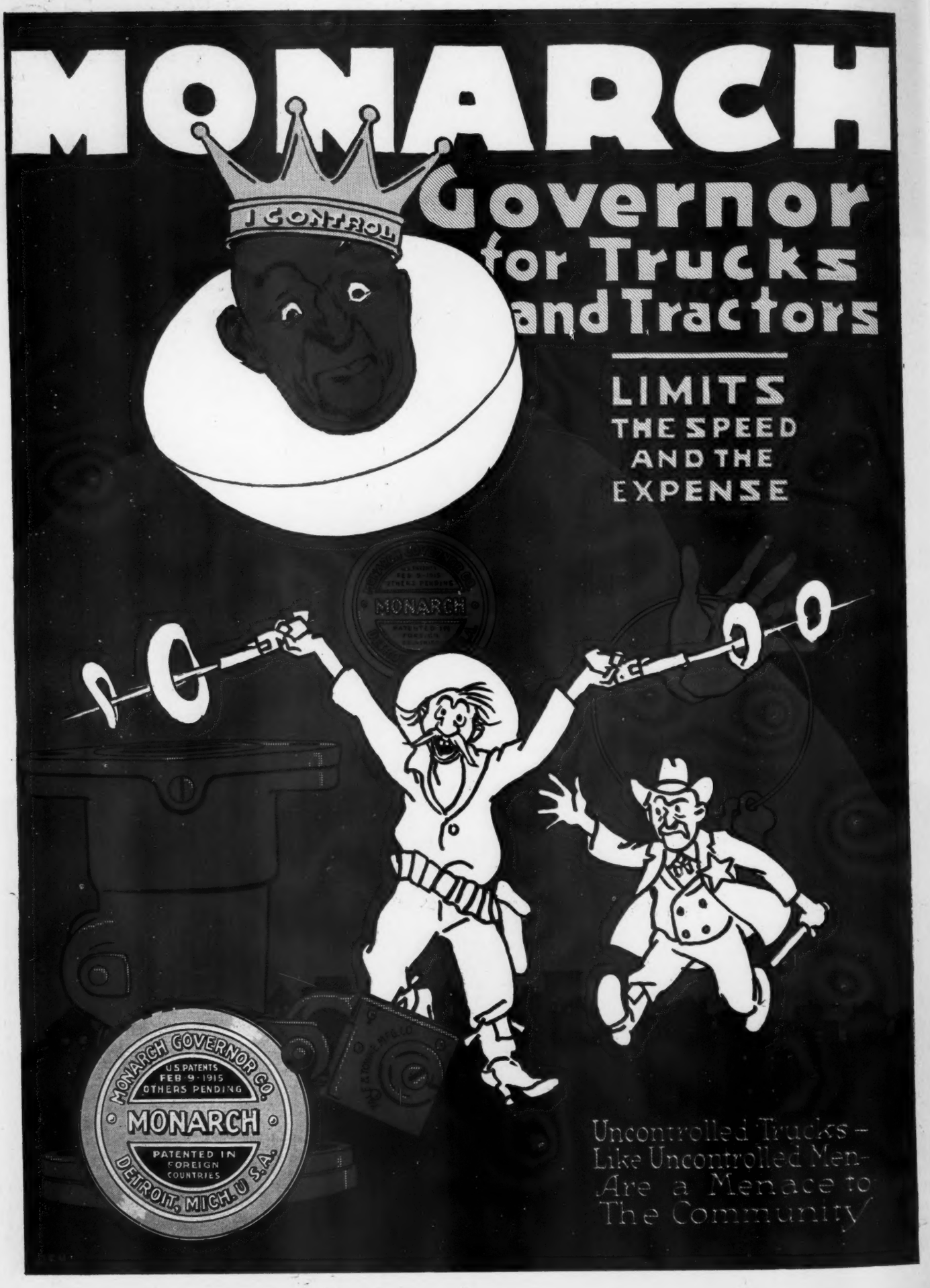
Tell him how the Lycoming is made—how it is constructed, part by part, by expert motor mechanics, many of them men who have spent over twenty years in the business. Inform him that the Lycoming is put upon a testing block and run under its own power from four to seven hours; how it is assembled and minutely examined for undue wear, defective material and workmanship before it is declared perfect. Tell him that the makers of the motor know so positively about how it will perform that they are willing to guarantee its performance indefinitely; that the inspection which each and every motor is subjected to is so thorough and rigid that the company stands ready to correct any trouble thru defective material or workmanship to the extent of a new motor.

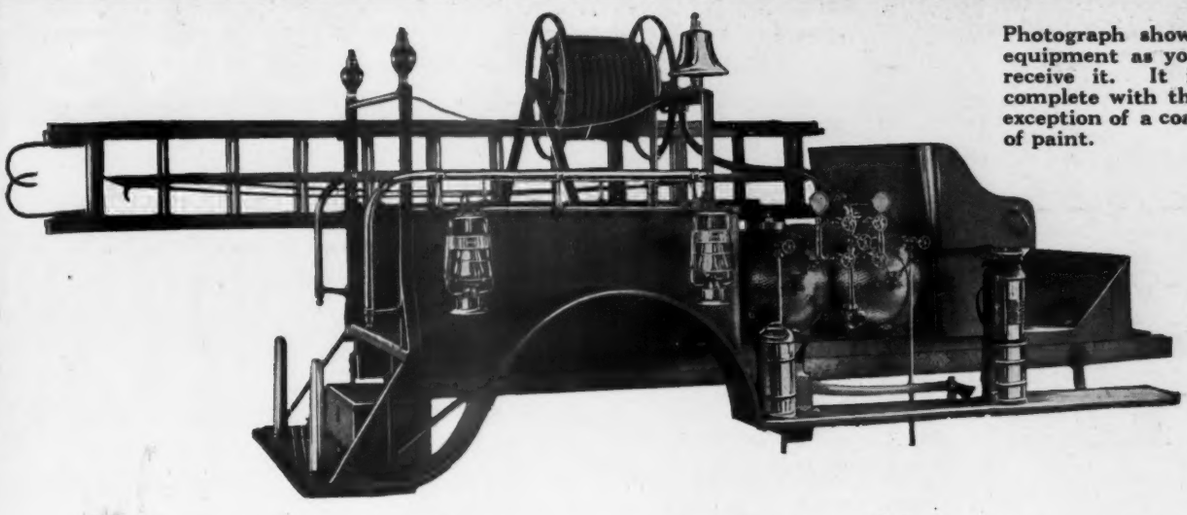
The presence of the guaranteed Lycoming Motor in any truck is certain to increase sales tremendously.

For inquiries as to output and deliveries, address:

The Lycoming Foundry & Machine Co.
Williamsport, Pa.


The Motor's Cradled
If you are looking for a motor truck to sell that really possesses a vital reason for existence; that really supersedes all other trucks because of an exclusive feature of extreme importance, choose the Forschler.
There is a possibility that your territory may still be open.
Constructed with two frames, an outer or load-carrying member, and an inner frame, supporting the vital parts, the Forschler is unique in the history of motor truck construction.
Forschler
DUAL (PATENTED) FRAME
The Truck With The Cradled Motor
It has solved, by its dual patented frame arrangement, the greatest enemy of economical transportation, i. e. —excessive depreciation. When Forschler dealers claim long life for their Truck, prospects can appreciate the reasons back of their claims. They know that each frame is supported by a separate set of powerful springs and that the motor mechanism and cab really swing suspended on the inner frame, independent of road jars and vibration.
Think of the immense advantage that such a feature gives to the efforts of any truck dealer. Write us.
The Forschler Motor Truck Mfg. Co., Inc.
Claibourne and Iberville Sts.
New Orleans, La.
Independent of the Road


MONARCH
Governor
for Trucks
and Tractors
I CONTROL
LIMITS
THE SPEED
AND THE
EXPENSE
MONARCH
MONARCH GOVERNOR CO.
U.S. PATENTS
FEB. 9. 1915
OTHERS PENDING
MONARCH
PATENTED IN
FOREIGN
COUNTRIES
DETROIT, MICH. U.S.A.
Uncontrolled Trucks –
Like Uncontrolled Men –
Are a Menace to
The Community



Photograph shows equipment as you receive it. It is complete with the exception of a coat of paint.

MAKE A DOUBLE PROFIT ON THE TRUCK YOU NOW SELL!

CHILDS APPARATUS is now made to fit any chassis—that means we can supply you with apparatus complete, ready to go on any make of motor truck you sell, giving you a new opportunity to make two profits where there was only one before.

You get this sturdy, dependable equipment all complete, except a coat of paint; it hooks up to the chassis by tightening some bolts. Then you deliver the fire department truck complete.

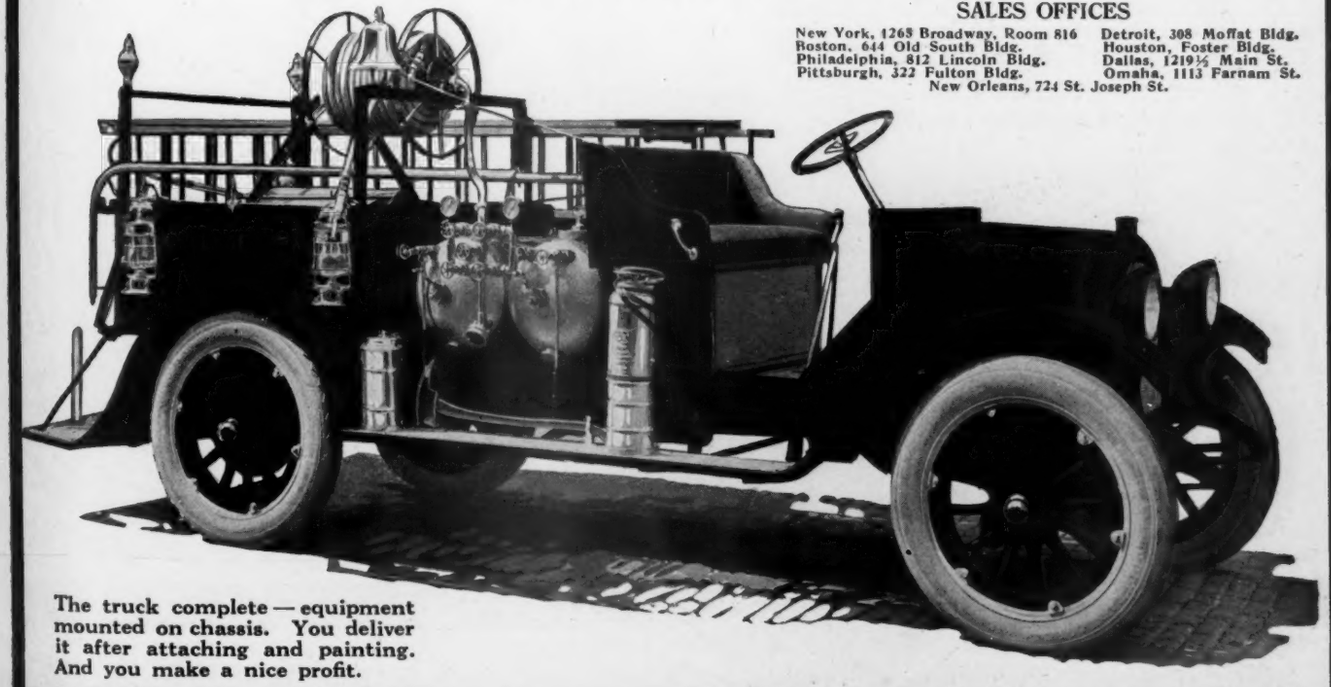
Sell a fire truck to your town. A chance for a sale you never made before—a profit that you have been missing.

Makers of Fire Apparatus for the past 20 years

O. J. CHILDS COMPANY, UTICA, N. Y.
FIRE APPARATUS

SALES OFFICES

New York, 1265 Broadway, Room 816
Boston, 644 Old South Bldg.
Philadelphia, 812 Lincoln Bldg.
Pittsburgh, 322 Fulton Bldg.
Detroit, 308 Moffat Bldg.
Houston, Foster Bldg.
Dallas, 1219½ Main St.
Omaha, 1113 Farnam St.
New Orleans, 724 St. Joseph St.



The truck complete — equipment mounted on chassis. You deliver it after attaching and painting. And you make a nice profit.

SPEED

POWER

SPACE

APPEARANCE

WEIGHT

5 REASONS

for the use of the

COLUMBIAN LIGHTNING HOIST

There are certain standards by which the ultimate efficiency of a hand hoist is judged.

Has it speed is the first? The Columbian is well named the "Lightning Hoist." In less than two minutes it raises a dump body to an incline of from 30 to 50 degrees.

Has it power? A hoist with a test capacity of 30,000 lbs. is not a weak machine. By means of spur and bevel gears the Columbian lifts a load of six tons easily and quickly. One man at the crank does the work.

Does it occupy much space? A truck body is built for loads, not to carry a bulky, overhung hoist. The Columbian needs but nine inches of space back of the driver's seat. This enables the body load to be set forward, which rids the rear construction of excessive weight.

How does it look? Plain lines, concealed gears, and a finish that is dignified and substantial.

Is it heavy? Emphatically no, in the case of the Columbian. It has the lightest weight possible with its tremendous lifting power.

Every objection formerly offered to hand hoists is nullified by the foresighted construction of the Columbian.

It's the ideal hand hoist for every line of business that requires dumping equipment that will save time and economize on labor.

Truck Dealers: We will gladly confer with you about supplying the right hoist for your truck line whenever a sale is made involving the use of a hoist. Write us! Ask for folder No. 69.





The Columbian Steel Tank Co.

1601-21 West 12th St. Kansas City, Mo.

"Tanks for the World" **Established 1894**



These Marks on a Gear Are Proofs of Quality

BROWN-LIPE CHAPIN DIFFERENTIALS

They testify to the remarkable care exercised in every process of manufacture. Each one is put there by a skilled workman, after completing his operation on the piece, and is his "signature" to a job of which he is proud.

Recently one of the largest manufacturers of passenger cars in the world, using Brown-Lipe-Chapin Differentials exclusively, reported his replacements as less than one in many thousands.

Such dependable performance of an operating part is invaluable to the car manufacturer who would insure users of his product against trouble.

Whether it is differentials or transmissions, the buyer of Brown-Lipe Products always gets this same careful and accurate workmanship.

BROWN-LIPE-CHAPIN CO.
DIFFERENTIALS

BROWN-LIPE GEAR CO.
TRANSMISSIONS

Both at SYRACUSE, N. Y.

BROWN-LIPE GEAR TRANSMISSIONS

No. 7 of 40 Reasons for Superiority

Introducing four New Models

Strength! Power! Service!

Things that motor truck users of today insist upon. Qualities you as a dealer must look for in selecting a line of trucks to sell.

For 12 years, United States Motor Trucks have satisfied dealers and users on these and many other requirements.

The 1920 models emphasize, to a far greater degree, these features of United States Motor Trucks.

Look at the models on the opposite page. What do you see? Strength—massive, not too heavy for the service they must perform. Powerful—plenty of power for any emergency—not overpowerful or wasteful of energy.

Combine the two—Strength and Power—and get Service. United States Motor Trucks, always efficient in operation, permit great savings of oil, gasoline, tires and repairs.

Two years ahead in engineering design, construction, materials and refinement of details. Many unusual features, all incorporated for the first time in one line of trucks, are to be found in these new models.

Floating Power Plant. Special U. S. motor with hot spot manifold. Vacuum Feed. Worm drive. Seven inch cushions for driver's comfort. Hotchkiss drive. Cast radiator with vertical tubes. Three-piece hood. Fireproof dash. Worm and block type steering gear. I-beam front axle. Multiple disc clutch. Four speed transmission. Tubular drive shafts equipped with noiseless and oilless universal joints. Silico-manganese springs.

Each part has proven itself the correct unit by rigid test. Each part will perform as expected. Each part gives the added factors of safety so needed in heavy duty trucks.

DEALERS

You are going to sell motor trucks. Sell a complete line, one that fills every hauling need of your customers'. The United States line with a wide range of haulage capacities is the one you need.

The United States line spells "Opportunity" for you. It means money, success and satisfied customers.

Reserve your territory before it is gone. Don't let your competitor get in ahead of you.

Our dealer proposition is especially attractive to all, whether you are a new dealer, or an established dealer contemplating a change.

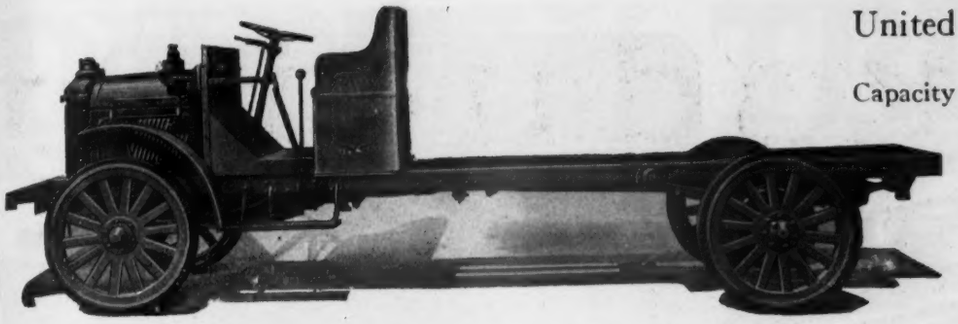
ADDRESS

W. M. KYLE,
The United States
Motor Truck Company
Cincinnati, Ohio.

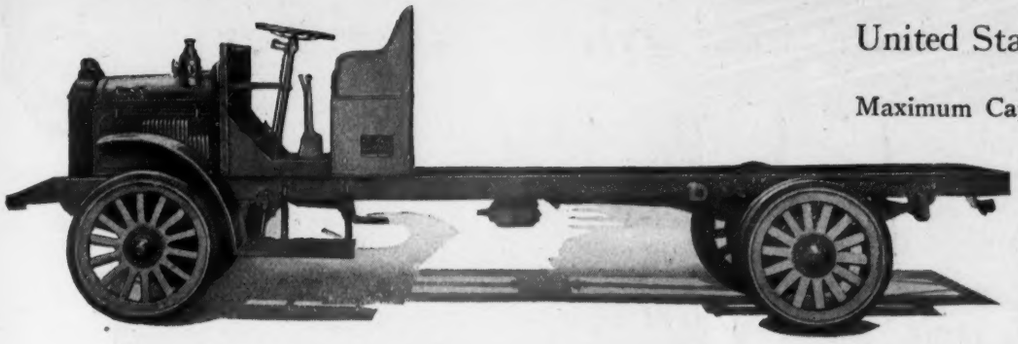
The United States Motor Truck Company

INCORPORATED

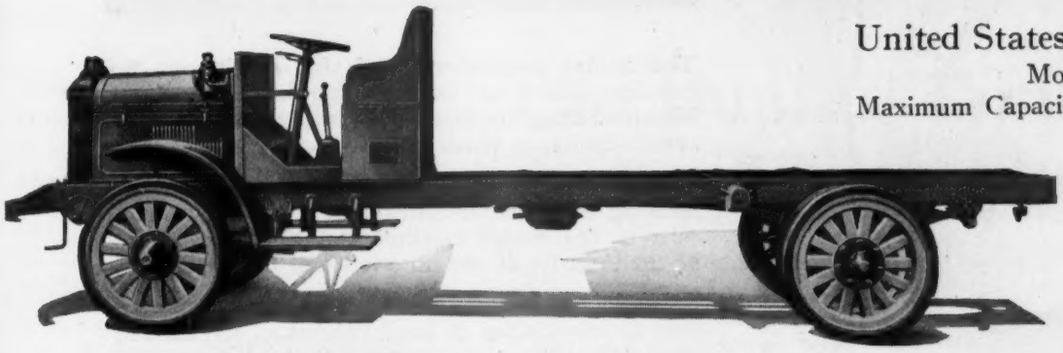
CINCINNATI, OHIO



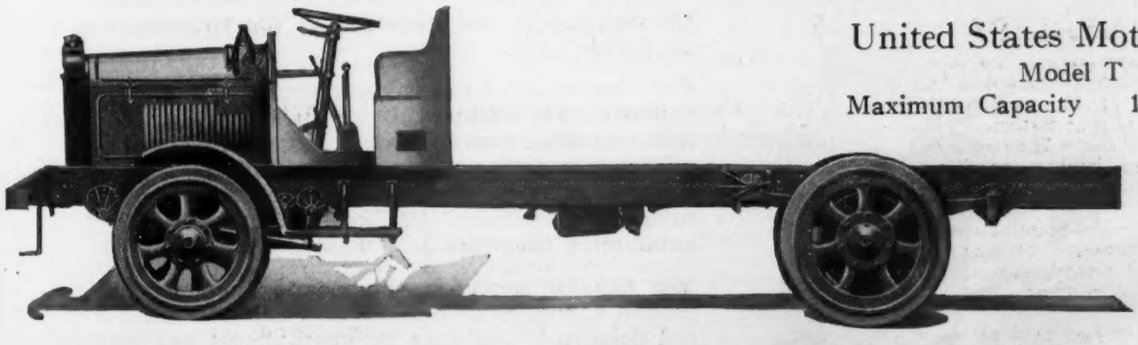
United States Motor Trucks
Model NW
Capacity - - - 1½ tons



United States Motor Trucks
Model R
Maximum Capacity 6,000 pounds



United States Motor Trucks
Model S
Maximum Capacity 8,000 pounds

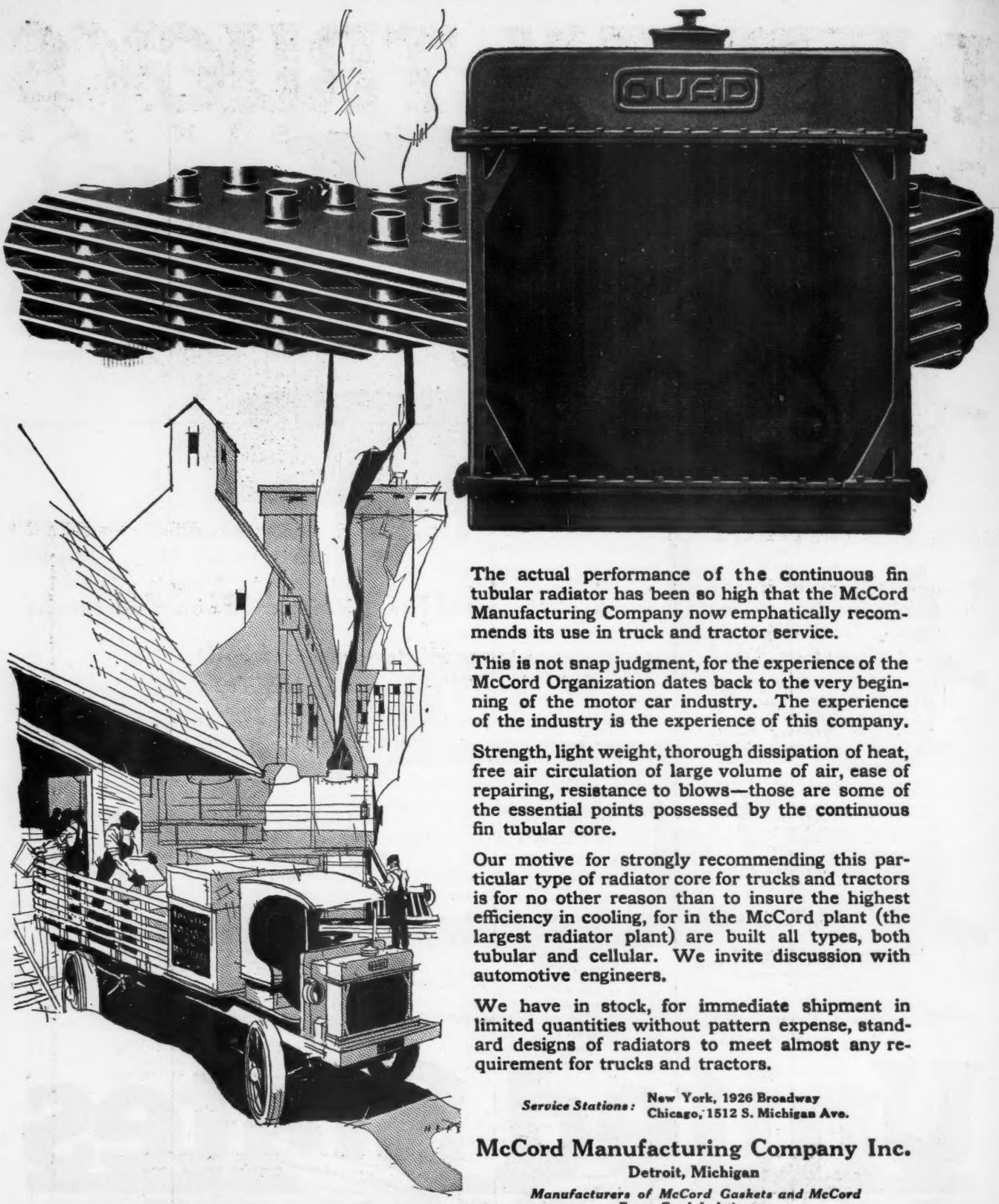


United States Motor Trucks
Model T
Maximum Capacity 12,000 pounds

United States Motor Trucks

FLOATING POWER PLANT

"AS GOOD AS THE NAME"



The actual performance of the continuous fin tubular radiator has been so high that the McCord Manufacturing Company now emphatically recommends its use in truck and tractor service.

This is not snap judgment, for the experience of the McCord Organization dates back to the very beginning of the motor car industry. The experience of the industry is the experience of this company.

Strength, light weight, thorough dissipation of heat, free air circulation of large volume of air, ease of repairing, resistance to blows—those are some of the essential points possessed by the continuous fin tubular core.

Our motive for strongly recommending this particular type of radiator core for trucks and tractors is for no other reason than to insure the highest efficiency in cooling, for in the McCord plant (the largest radiator plant) are built all types, both tubular and cellular. We invite discussion with automotive engineers.

We have in stock, for immediate shipment in limited quantities without pattern expense, standard designs of radiators to meet almost any requirement for trucks and tractors.

Service Stations: New York, 1926 Broadway
Chicago, 1512 S. Michigan Ave.

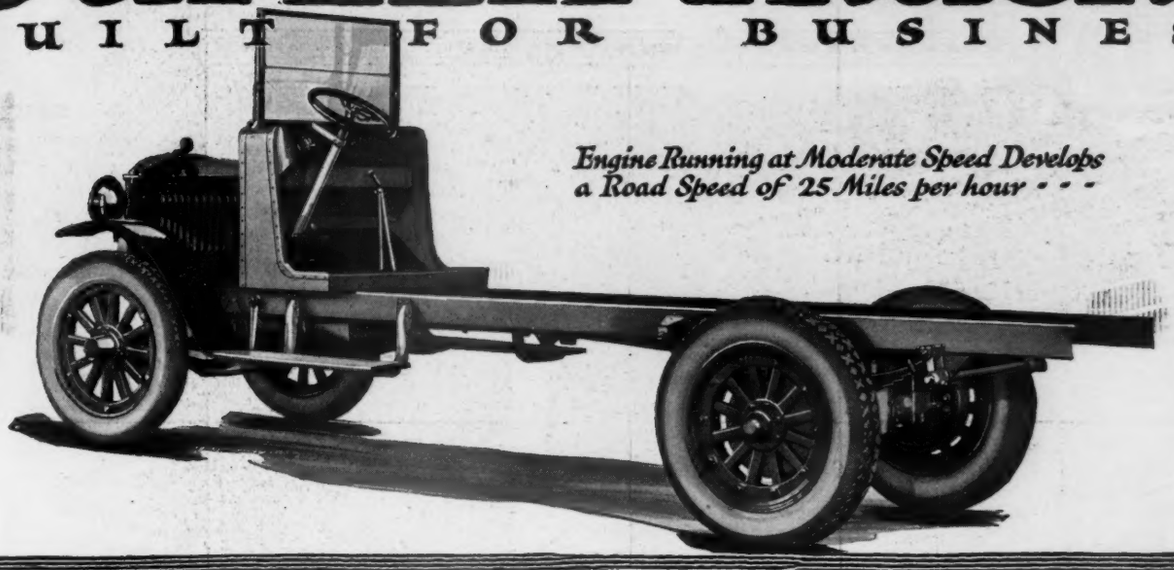
McCord Manufacturing Company Inc.
Detroit, Michigan

Manufacturers of McCord Gaskets and McCord Force-Feed Lubricators

McCord
RADIATORS

DUPLEX TRUCKS

BUILT FOR BUSINESS



Engine Running at Moderate Speed Develops a Road Speed of 25 Miles per hour - - -

Wherever There is Heavy Hauling to be Done There is a Ready Market for the Duplex 4-Wheel Drive Truck

THE great increase in the use of motor trucks—the larger hauls, the heavier loads—all these combine to provide a steadily increasing market for the famous, heavy duty 4-Wheel Drive Duplex.

Many a truck owner today is trying to get his money's worth of use out of a truck that isn't designed to do the work he has to do—trying to make an ordinary truck do the work that only a Duplex 4-Wheel Drive can do. Naturally his costs are too high; his depreciation too great.

Get the facts about Duplex 4-Wheel Drive Economy and Reliability before your prospects.

The facts are there, of course, and they are all in your favor but the *truck owner needs to have them made plain to him.*

The demand for Duplex 4-Wheel Drive Trucks was never so great as this year. Get your share of the business—and start getting it now.

Duplex 4-Wheel Drive Truck
Price $4250, *f. o. b. Lansing*



The Duplex *Limited*

Opens Wider Selling Fields for All Duplex Dealers

MANY Duplex dealers are already feeling the impetus of increasing demand, since the Duplex Limited came on the market.

Here is a truck for *general business purposes.* Medium Capacity, Pneumatic Tired, Complete Electrical Equipment, *High Speed,* and backed by the prestige of the famous Heavy Duty Duplex 4-Wheel Drive. The addition of the Limited puts Duplex dealers in a position to fill the needs of 75% of the truck market.

Duplex performance, Duplex reliability and Duplex economy are well known among truck buyers—and for some time we have been feeling the pressure of demand for a *High Speed* Duplex from men in all lines of business.

The Limited is destined for conspicuous success. Its price, $2575 f. o. b. Lansing is low enough to insure a great growing market and the prestige of the name Duplex leads careful buyers everywhere to accept the Limited immediately as one of the most successful medium capacity, high-speed trucks now on the market.

Truck value—real value—is what the truck buyer is seeking—and the facts about Duplex reliability, Duplex Performance and Duplex Economy are becoming more and more the *buying standards* of the critical truck buyers of today.

Remember the Duplex Limited is a Duplex through and through—designed and built in response to a present demand and to fill a gap that is getting bigger every year.

The Duplex business is growing faster and faster and your individual business can grow with it, The business for Duplex Trucks is there in your territory and you can get it.

The Limited is a success now—and the field is big. Get your share of the business and *start now.*

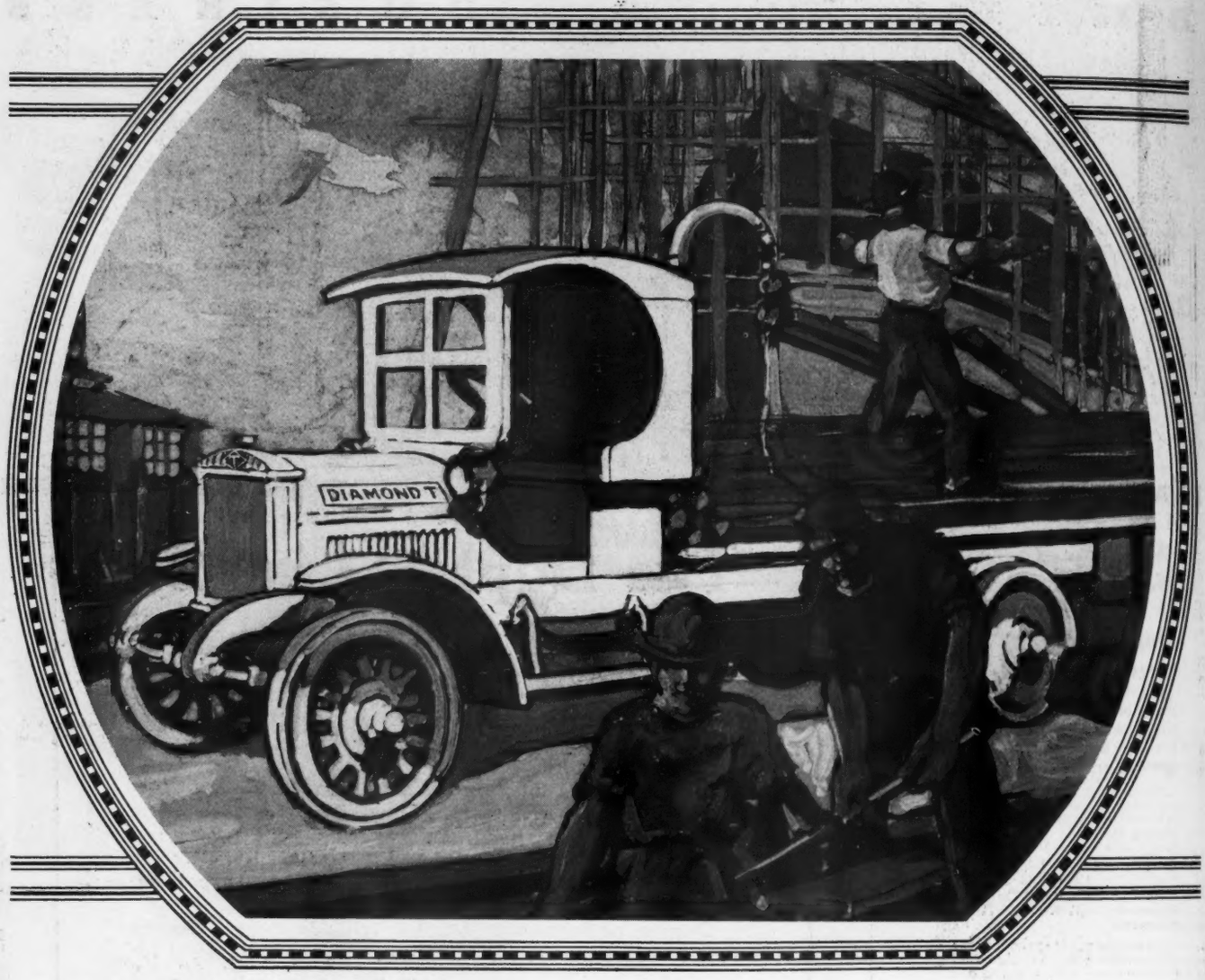
Duplex Limited—Medium Capacity—Two-Wheel Drive—High Speed $2575, f. o. b. Lansing

DUPLEX
BUILT FOR BUSINESS

Duplex Truck Company
Lansing • Michigan

One of the Oldest and Most Successful Truck Companies in America

"The Nation's Freight Car"



Rarely Re-Sold—Why?

Because the service-limit of Diamond T construction and the quality-limit of Diamond T workmanship haven't yet been reached by owners of the first Diamond T's, built in 1911. The same standards of service and quality have been kept through every production year, so that when a Diamond T *does* change hands, the reason invariably lies outside the truck.

Cheap performance identifies cheap trucks, and cheap trucks are soonest seen on the second-hand market. The logic of Diamond T ownership, therefore, makes money and saves money by the only method that permanently satisfies—the economy of excellence. And isn't the economy of excellence, after all, the only *true* economy?

DIAMOND T MOTOR CAR CO.

4509 W. 26th Street Chicago, Illinois

DIAMOND T

This fleet of Pierce trucks is operated by Kaufmann's, "The Big Store," Pittsburgh. Pierce trucks and passenger cars are REES JACK *equipped.*



REES
DOUBLE WORM GEAR DRIVE
Reg. U.S. Pat. Off.
JACK



Why Leaders Lead



The Rees Passenger Car Jack

This cutaway view shows in general the simple design of only four working parts as embodied in all Rees Jacks. This model is easily operated from a standing position by its convenient folding handle. At your dealer's, or sent prepaid. Price, $9.00; west of the Rockies, $9.50.

BACK of the leaders in every line will be found *good management.* The evidence of this good management is appreciation of a public need, and meeting it with a quality product which is equipped in a manner that will most serviceably fulfill that need.

When leading truck manufacturers such as Pierce-Arrow, White, Acme and others adopt *Rees Jacks* as standard lifting tool equipment, the quality and leadership of the Rees among jacks is clearly indicated. Significant also is their adoption by fleet owners, such as Gulf Refining Company, operating almost one thousand trucks.

The most important tool for a car or truck is a dependable jack. Motorists are realizing this, and as the result there is an ever-growing market for Rees Jacks. *Jobbers* and *Dealers* should profit by this big sales opportunity by stocking and displaying the Rees.

Exclusive Manufacturers

Iron City Products Company

Department 29

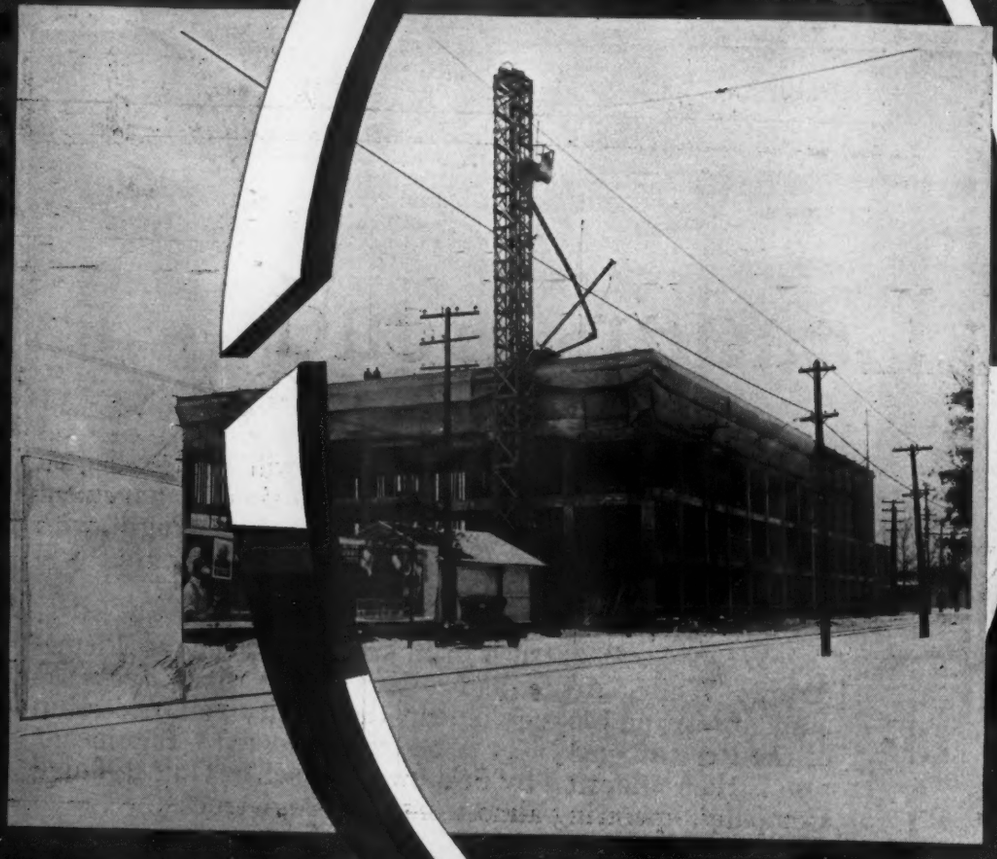
7501 Thomas Blvd., Pittsburgh, Pa.

Manufacturers of Rees Double Worm Gear Drive Jacks for Passenger Cars, Trucks, Railway and Industrial Purposes

QUALITY SNAP RINGS



An ever-increasing expansion means an ever-increasing Service

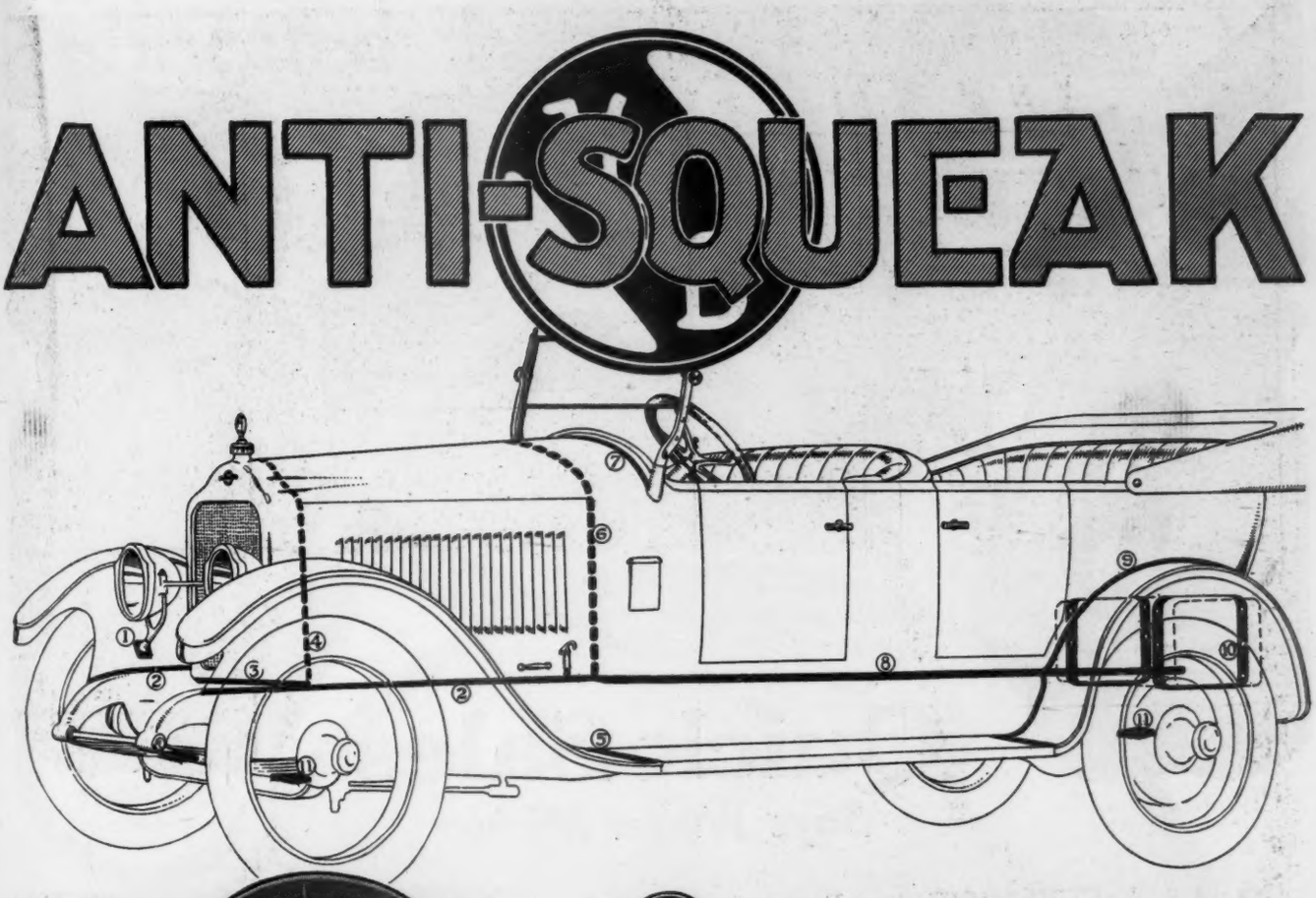


"MORE THAN A MILLION A MONTH"

THE Piston RING COMPANY

106 SANFORD ST. MUSKEGON, MICH.

ANTI-SQUEAK





The above illustrates three cutaway sections of a car, showing H L B Anti-Squeak Cowl Lacing, Frame Padding and Fender-to-Runningboard Pad.

Anti-Squeak

Kills the Squeak—Keeps it Killed

H L B Anti-Squeak has proved its superior quality and durability on more than 70% of the motor cars and trucks built in America.

Used as padding for frame, fenders and radiator, etc., also folded and stitched for hood and cowl lacing, H L B Anti-Squeak kills squeaks and rattles and eliminates friction and wear in all parts of a car or truck where metal rubs metal.

Made of selected cotton throughout—no jute filler is used. Woven by a patented process which gives a close, uniform weave, imparts toughness and makes it absolutely heat-proof, moisture-proof and oil resisting.

H L B Anti-Squeak retains its squeak-killing qualities indefinitely—gives better, longer service, yet costs less than any other type of anti-squeak.

Are You Equipping Your Car or Truck With These Necessary Parts

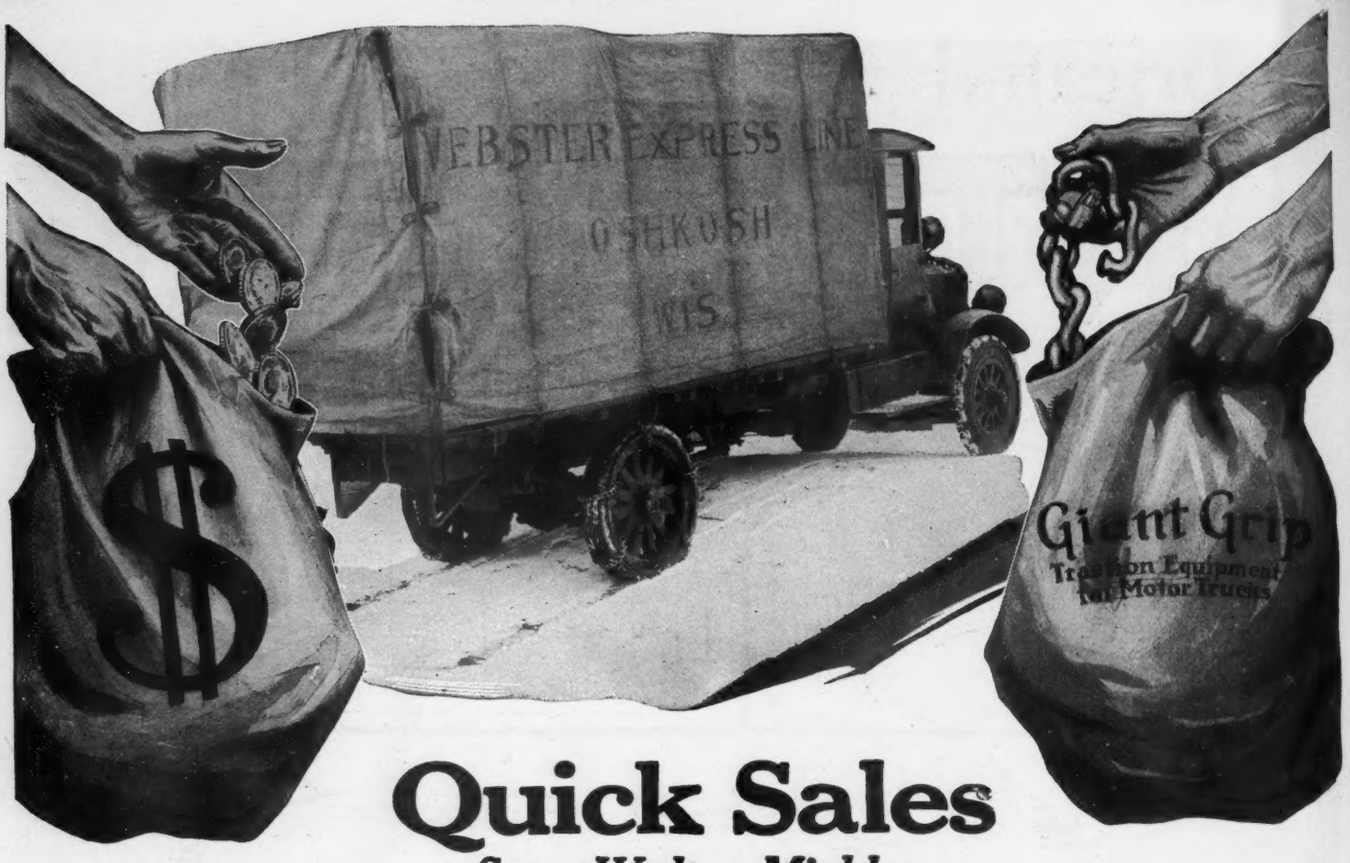
H L B Anti-Squeak is made for the parts listed below, in all standard sizes, or to your specifications. Also furnished in rolls of any desired length, width or thickness.

1. Lamp bracket shim.
2. Fender to frame pad. (front)
3. Radiator pad.
4. F & S Hood lacing.
5. Fender to running board pad.
6. F & S Cowl ledge lacing.
7. Windshield rest pad.
8. Frame and body pad.
9. Fender to frame pad. (rear)
10. Gas tank strap pads.
11. Spring seat pads.

Send us your blue prints or full details of your anti-squeak needs, and we will promptly give you estimates and samples.

HIDE LEATHER & BELTING CO.

Indianapolis, U. S. A.



Quick Sales

Says Walter Michler

MR. WALTER MICHLER of Fond du Lac, Wisconsin, reports that he sold over 100 sets of Giant Grip Traction Equipment in the last four months with very little effort.

He simply called a truck-owner's attention to the fact that with Giant Grips he could get 100% efficiency from his trucks in any weather and under any road conditions. After that "it was easy to make a sale, and one sale helped make others."

Mr. Dealer, are you taking advantage of this opportunity in your locality? With the Giant Grip line you have fewer models to handle. One style fits over 400 makes of trucks. Write to us for details of our dealer proposition.

Giant Grip Traction Equipment consists of clamps permanently attached to the wheels, and of chains and hooks carried in the tool box when not in use. Two minutes and his own two hands are all the driver needs to apply or remove them. No tools—no jacking up the wheels.

Let us show you how we can help you make some quick sales. Send for catalog and particulars today. Dept. 10.



Challoner Company

Established 1863 **Dept. 10 Oshkosh, Wisconsin**

Giant Grip

Traction Equipment for Motor Trucks

Lubricated for a Lifetime

The material from which the cam of the Westinghouse Type "SC" Ignition Unit is moulded was developed in the Westinghouse Research Laboratories. In this material, graphite is effectively incorporated.

As a consequence the cam requires no lubrication from an outside source and is certain, under ordinary conditions, to outlast the car on which it serves.

This cam typifies the attention given to details in the design of this new Westinghouse Standardized Two-Unit Battery Ignition, of which other outstanding features are the self-cleaning contacts, the waterproof, air-tight condenser, moisture-proof coil, and accurate electrical balance between coil and condenser.

These features are all illustrated in Circular 1606. A copy will be mailed you on request.

WESTINGHOUSE ELECTRIC & MANUFACTURING CO.
Automobile Equipment Department
General Sales Office, 110-114 West 42nd Street, New York City



Westinghouse
STANDARDIZED IGNITION FOR AUTOMOTIVE VEHICLES

An Efemco Product



All Efemco Piston Rings must appear before my bench. I either pronounce them perfect or I condemn them. My verdict is final and does not permit of compromise. You can depend on every one of these rings.

MIKE ROMETER
Court of Final Inspection.



ALL Efemco Piston Rings are manufactured to micrometric limits. They fit the contour of the cylinder wall, fit the piston grooves, and press against the cylinder wall with equal radial pressure.

Fine material, skilled workmanship and ingenious engineering stand back of Efemco Piston Ring performance which eliminates, as far as possible, leakage of any sort.

This means increased efficiency represented by the important savings in engine repair and upkeep costs.

Efemco Piston Rings are distributed through the jobbing trade by Fulton, Houston Company, 624 So. Michigan Avenue, Chicago, Illinois.

FOSTER, MERRIAM & CO., MERIDEN, Conn., U.S.A.

Efemco PRODUCTS

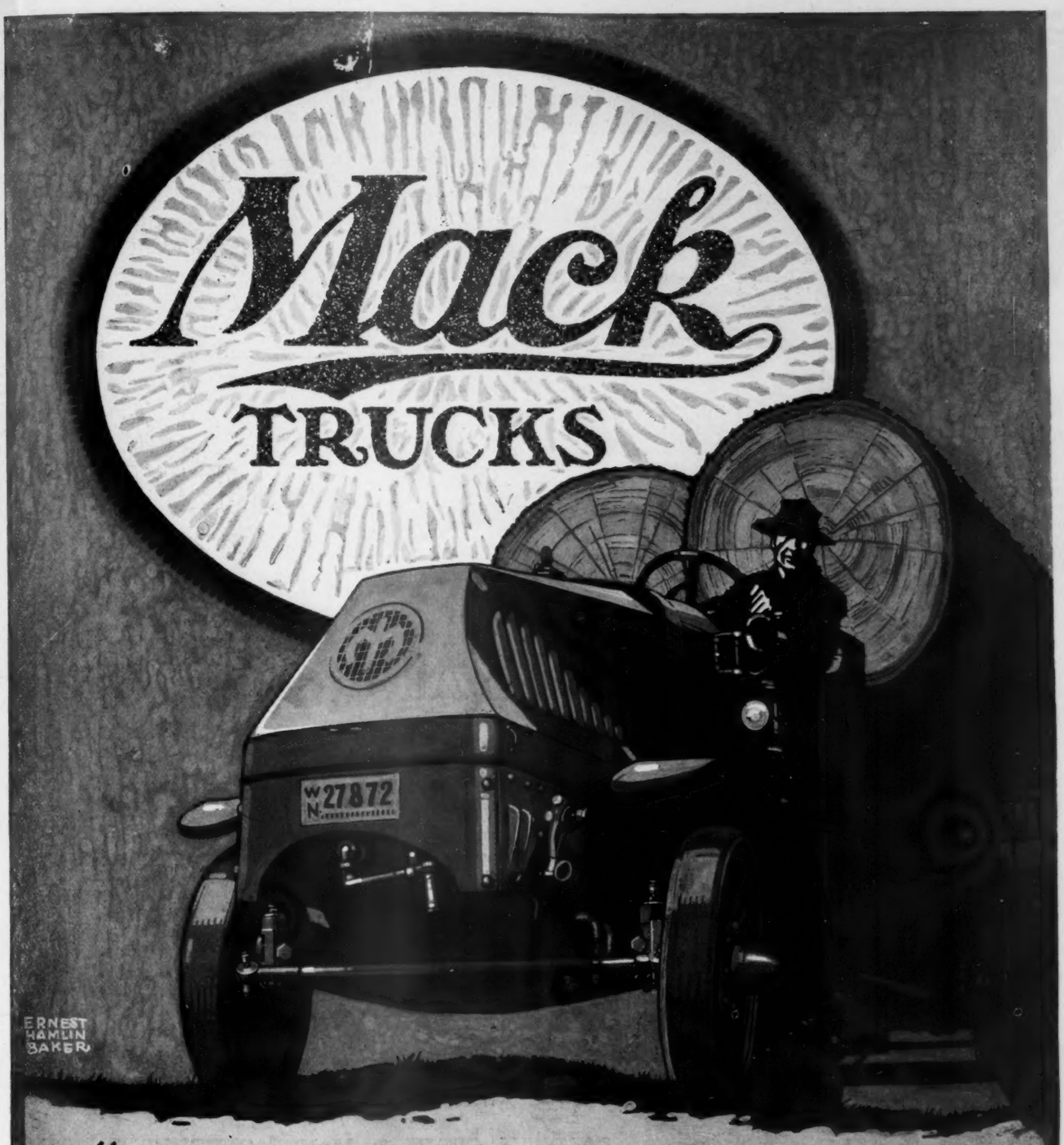
Automobile Accessories
Roller Bearing Casters
Ball Bearing Casters

Piston Rings
Truck Casters
Grip Neck Casters

Grey Iron Castings
Furniture Trimmings
Cast Aluminum Ware

Efemco Products / Efemco Products / Efemco Products / Efemco Products / Efemco Products / Efemco Products

Standardized by 85 years of service

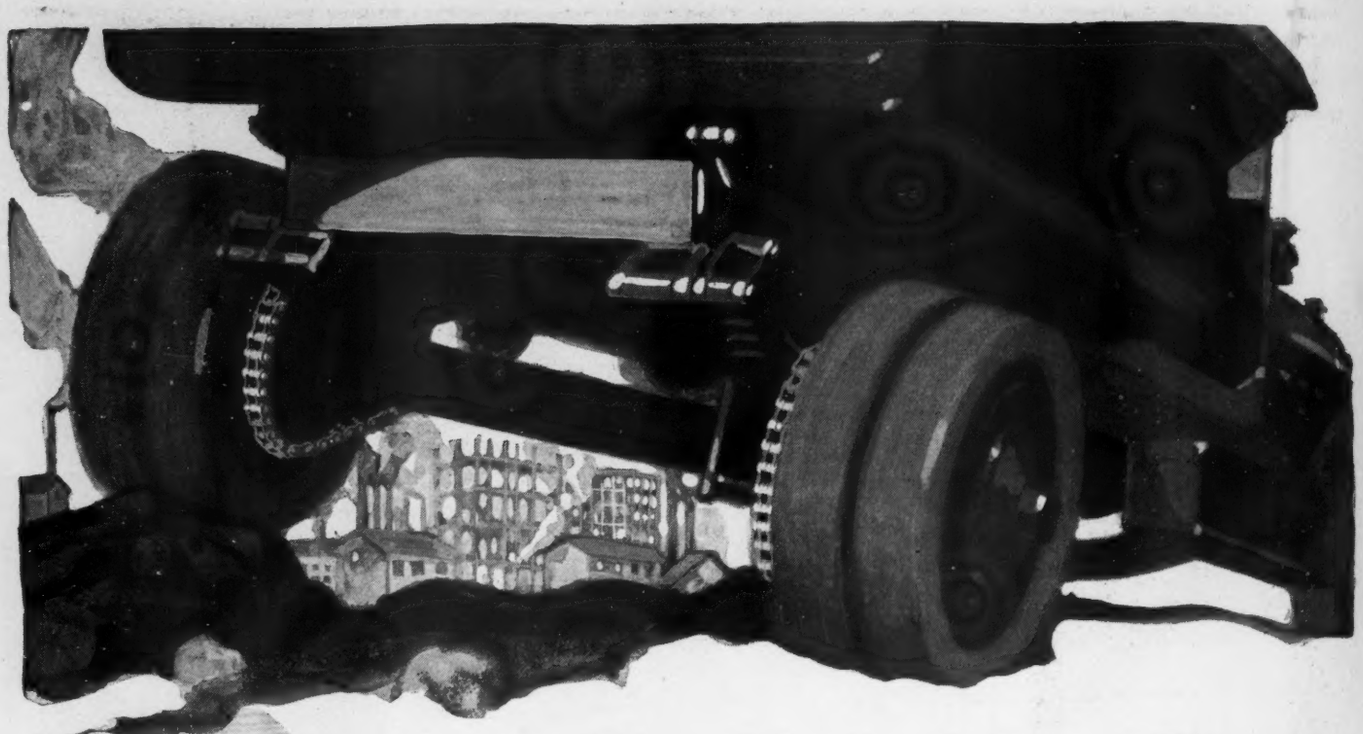


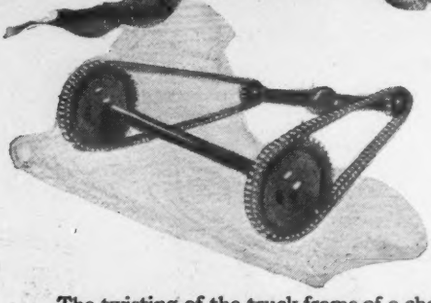
"PERFORMANCE COUNTS"

Power and strength! These two qualities of MACK Trucks impress themselves on all observers. They are the outward indications of that inward perfection of design and manufacture that keep MACK Trucks constantly on the job. Bodies for all kinds of service and special loading and unloading appliances, too.

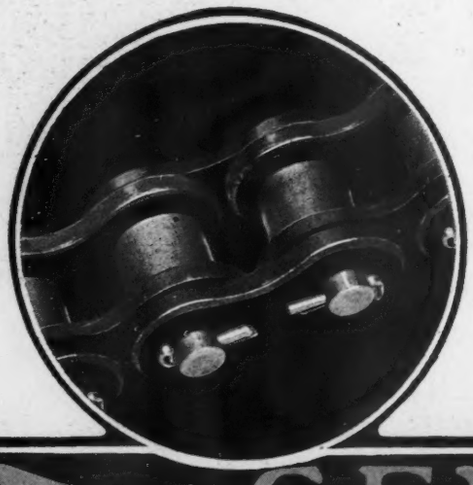
Capacities 1½ to 7½ tons. Write for catalogue.

INTERNATIONAL MOTOR COMPANY, NEW YORK





The twisting of the truck frame of a chain driven truck does not "hand along" the wrench to the vital, more delicate motive parts because chains have the ability to most completely absorb these shocks.



The Chain Driven Truck Meets All Road Conditions

THIS real ability of the chain driven truck to negotiate rough and uneven ground without damage and without exposing delicate mechanisms to severe and unbearable shocks is the direct result of these proven principles—

The chain is the only form of drive that has the necessary flexibility to absorb such shocks. In this respect it is unlike the rigid form of drives, which, once displaced by such jolts, rapidly wear out and necessitate complete and expensive replacements.

Again, in chain driven trucks, the entire transmission mechanisms are carried by the frame, where they are immune to wheel loads and direct shocks, instead of on the axle where they must be continually exposed to them.

Baldwin chain drives have "grown up" with the truck industry. They have been used on most of the better, most successful chain driven trucks since these trucks were first manufactured.

BALDWIN CHAIN & MANUFACTURING COMPANY
WORCESTER, MASS.

H. V. Greenwood, General Western Sales Agent
Peoples' Gas Building, Chicago, Ill.

GENUINE
BALDWIN
CHAINS

Timken Leadership

In the Fleet

Ask the traffic manager of a great store, of a trucking concern, of an express company, or any industry operating a fleet of trucks, what he thinks of Timken Tapered Roller Bearings.

It is an easy way to get first-hand, unbiased information about Timken quality, and a sure way to find out some surprising facts about Timken ability to function properly under radial load, or thrust load, and all possible combinations of the two.

Concerns that have put their transportation on an up-to-the-minute basis and maintain carefully supervised fleets are quickest to acknowledge Timken leadership in the bearing field.

THE TIMKEN ROLLER BEARING COMPANY
Canton, Ohio

Timken Tapered Roller Bearings for Passenger Cars, Trucks, Tractors, Farm Implements, Machinery, and Industrial Appliances.

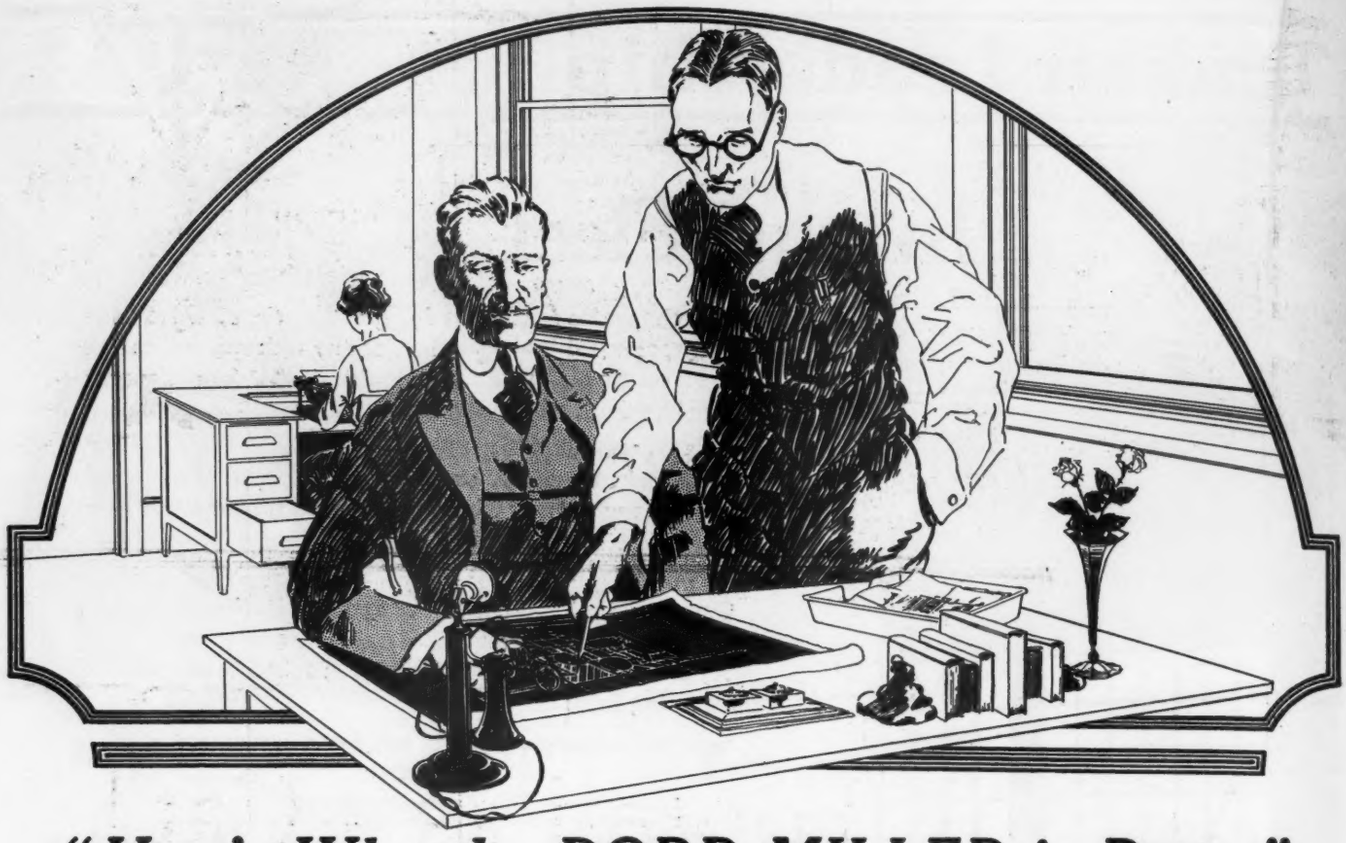




STANDARD PRACTICE

The use of Timken Tapered Roller Bearings at points of hard service in the great majority of motor-vehicles is proof of leadership established on the tapered principle of design, quality of manufacture, performance on the road, and service to the automotive industry.

TIMKEN BEARINGS

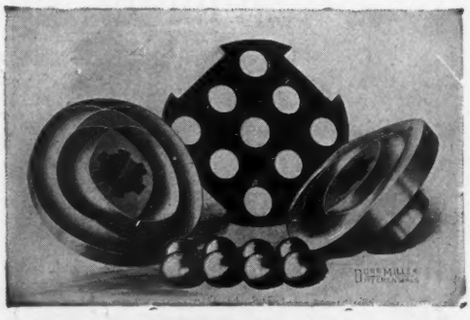


"Here's Why the DORR-MILLER is Better"

Says the Truck Engineer

IT DELIVERS maximum application of power, at all times, through the utilization of 100 per cent traction, which prevents spinning.

When the Truck is in slippery places with one driving wheel on firmer ground than the other, the Dorr-Miller Differential applies to the wheel with better ground resistance, the exact amount of power that the other finds it impossible to utilize, making a steady and economical operation.

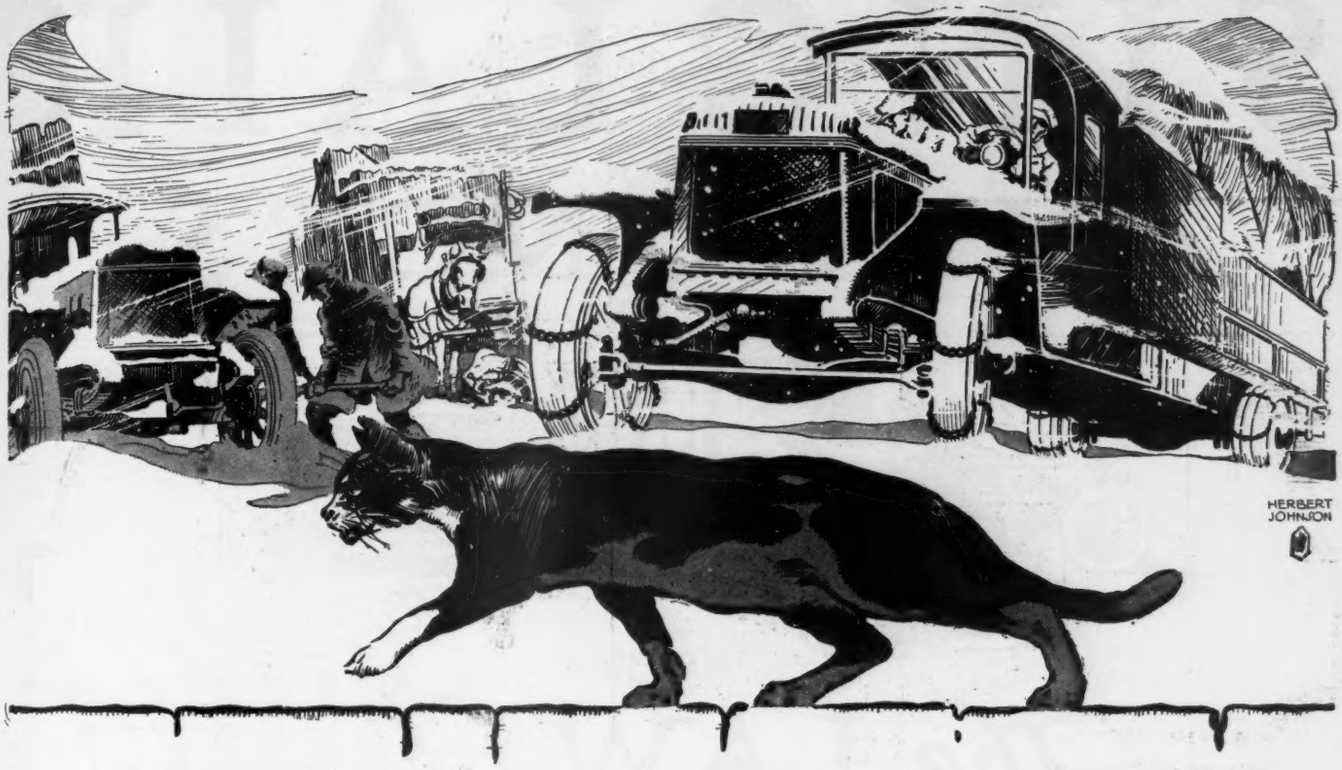


There are only 4 units in a Dorr-Miller Differential: a driving plate; two groove blocks and eight steel balls, through which the power is transmitted. The simplicity of construction almost entirely eliminates depreciation, as the wear is on the large flat surfaces of the groove blocks. No wear occurs on small surfaces and the groove blocks are made of high-grade metal. The Dorr-Miller is superior to all differentials in that it provides uniform traction on both wheels. Whenever spinning starts, one groove plate moves away from the central driving plate, causing the outside surface of the groove blocks to bind against the inside surface of the friction plate, which is held rigid in the assembly and causes the differential automatically to cease its differential action. A solid unit of moving parts is formed which compels the differential to transmit equal power to both wheels.

No change in axle housing is required or in bearing layout. Reasonable prices due to quantity production.

The Forest City Machine & Forge Co.
Cleveland, Ohio

DORR MILLER DIFFERENTIAL



As Sure Footed as a Cat!

You can keep your trucks moving, regardless of weather conditions, if you equip them with

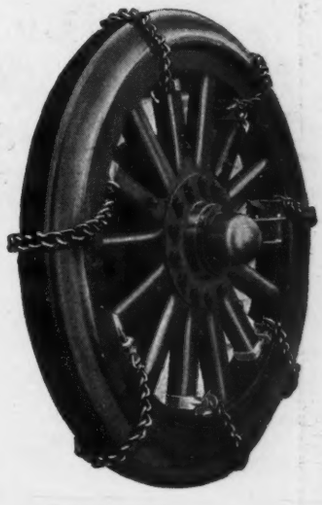
ABC Safety Grips

They actually gear the wheel to the road, and enable your trucks to pull through mud or hub-deep drifts, over slippery ice or "greasy" asphalt under full load or no load—ON TIME.

They're built strong and husky—grips are bolted to the wheel, and stay there—chains can be attached or detached in an instant. Grips are fully guaranteed for one year. They're worth their weight in gold to any truck owner.

Bulletin J E M-2 describes them in detail—write for your copy today.

Order them of your dealer—if he hasn't them, have him ask his jobber.



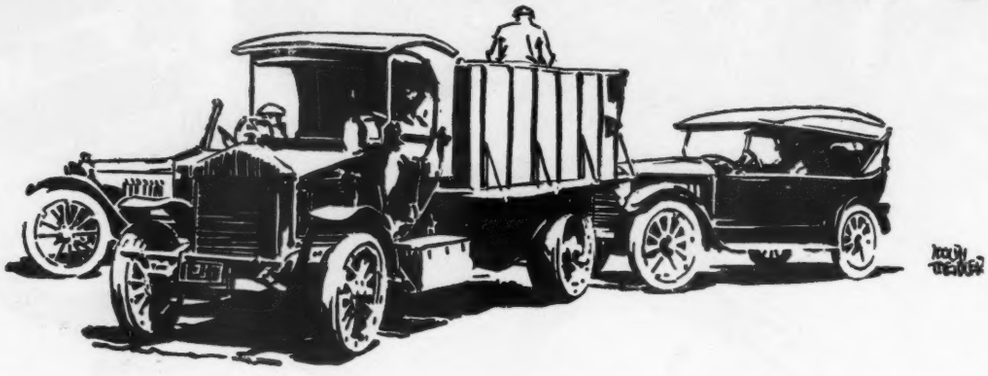
Jobbers and Dealers!

Our merchandising plan has been designed to protect you. We propose to see that you get *more* than an "even break"—your co-operation will secure you surprising volume and profits. Write *now* for details of our proposition.

American Business Corporation, Automotive Division

Suite 703 1780 Broadway New York

SINCLAIR ANNOUNCES

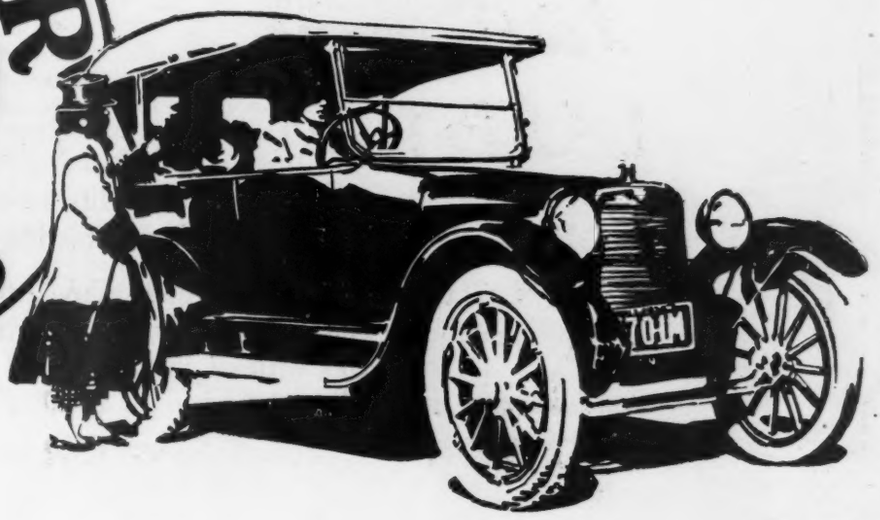


The LAW of LUBRICATION

FOR EVERY MACHINE, of EVERY DEGREE of WEAR there is A SCIENTIFIC SINCLAIR OIL to SUIT its SPEED AND CONSERVE its POWER.

THE first scientific and authoritative standard of practice for automotive lubrication—Announced to the oil users of the world by THE SINCLAIR ADVERTISING CAMPAIGN, 1920.

SINCLAIR OILS



SINCLAIR dealers will be shown how to apply the Law of Lubrication to the betterment and enlargement of their business. Write for the Sinclair Recommendation Index—based on the Sinclair Law. It revolutionizes the retail oil business.

SINCLAIR REFINING COMPANY, CHICAGO

Atlanta	Denver	Louisville	Norfolk
Brockton	Detroit	Minneapolis	Omaha
Buffalo	Houston	Newark	Rock Island
Cleveland	Kansas City	New Orleans	Tulsa
			Wichita

SAVAGE  AXLES

THINGS THAT SAVAGE AXLES DO NOT DO—

No. 6. Do not require jacking the truck for renewing parts

ALL moving parts are readily accessible, simple and inexpensive, though lasting in service.

The driver on the road knows the advantage of being able to renew any part of his differential or live axles without lifting up the truck or dismantling the wheels.

SAVAGE ARMS CORPORATION
SHARON, PA.
UTICA NEW YORK DETROIT

SAVAGE

Sterling Spark Plugs



Tractor Plugs Are Best for Heavy-Duty Trucks

Loaded to capacity, yet negotiating the most difficult roads with ease, your motor truck equipped with Sterling Tractor Spark Plugs, will utilize every ounce of its power.

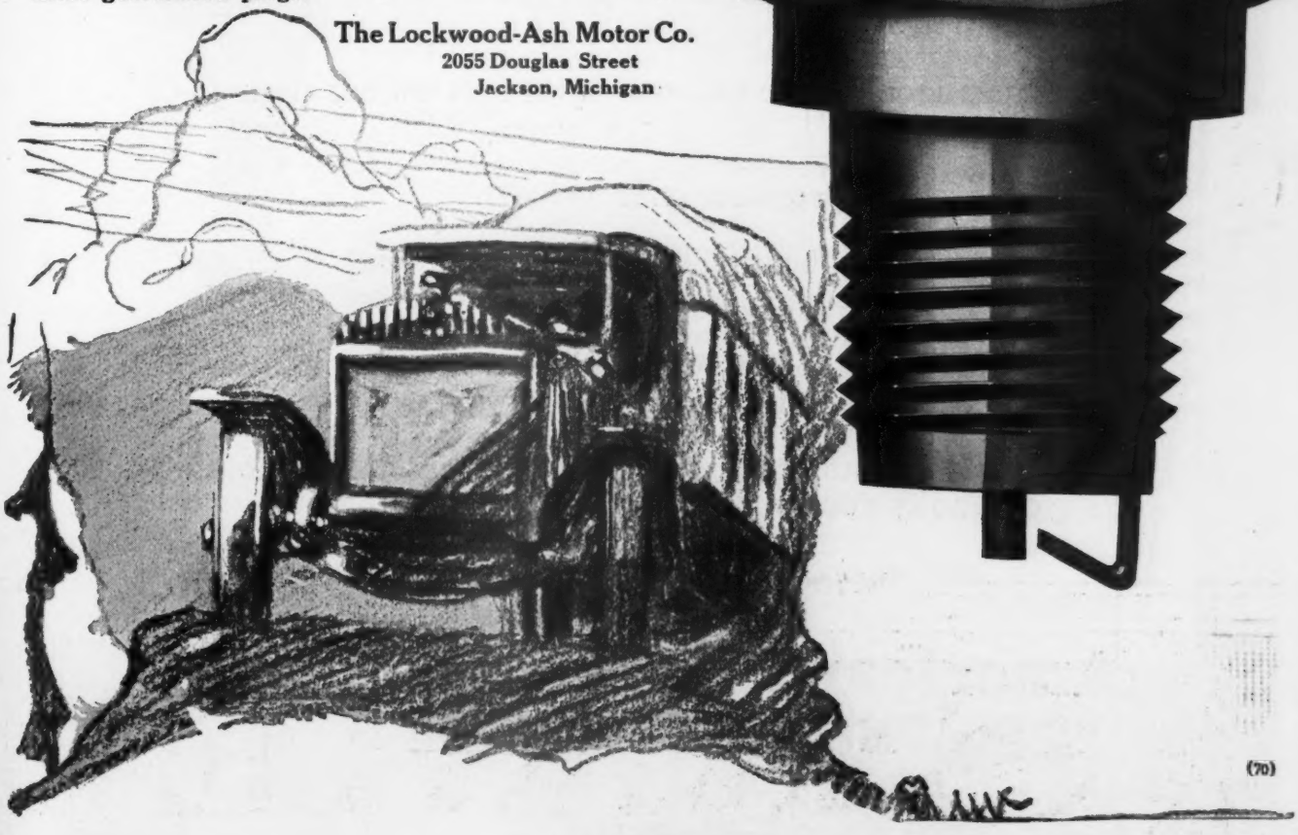
Sterling Tractor Plugs have been developed to meet the demands of heavy-duty motors whose intense heat shortens the life of ordinary plugs.

Motor truck owners quickly discovered that these tractor plugs, feeding a strong, steady current into the cylinders of the engine, give a greater and surer power when loads are heavy and roads rough or hilly.

Sterling Tractor Plugs are made with a porcelain core of unusual strength; an extra deep combustion chamber, and the center electrode, of monel metal, will not warp. Then, too, Sterling Plugs are separable and easily cleaned.

Garages and supply dealers everywhere sell and endorse these guaranteed plugs.

The Lockwood-Ash Motor Co.
2055 Douglas Street
Jackson, Michigan



(70)

SEPARABLE  CLEANABLE

ATLAS AXLES
2, 3½ and 5 Ton Sizes



Some of the features enumerated below are exclusive. All of them are proven.

1. One-piece cast steel box girder load-carrying member of extreme stiffness and light weight, enclosing the driving members.
2. Exceptional ground clearance of 16¾ inches with 36-inch wheels.
3. Straight-line propeller shaft drive.
4. All gears and bearings operating in oil bath with dirt positively excluded. Not a grease cup on the axle.
5. Driving gear and pinion centered in plane of wheel rotation, eliminating eccentric loading.
6. Double internal expanding brakes, completely enclosed, yet readily accessible for adjustment.

Write for a copy of our bulletin

American Machine Company
Newark, Delaware



DOUBT never enters the head of the chap who employs a Walker Badger Truck Jack. He doesn't know the definition of delays due to defective Jack operation. Walker Badger Jacks possess in-built quality and a superabundance of it. Each part is as carefully made as though the entire operation of the Jack depended solely upon it.

There are no weak features. Every piece from base to lifting cap is 100% perfect. There are no internal disturbances—no hindrance to efficient action by faulty or ill-fitting parts. No binding—no lost power. Every working part machined in jigs. Pawls are of drop-forged steel—virtually indestructible. Automatic lock that stays "put" as long as you want it.

Pressure is evenly distributed, there's no uneven wear anywhere. No wasting away of parts to create trouble, breakage and back-breaking work for user. Every Jack is factory-tested for lifting strength—labeled with load capacity and guaranteed to give absolutely satisfactory, thoroughly efficient service.

A world-wide reputation for thorough dependability renders them essential as standard equipment on quality-built trucks and as regular stock with accessory dealers who endeavor to give their patrons products of highest merit.

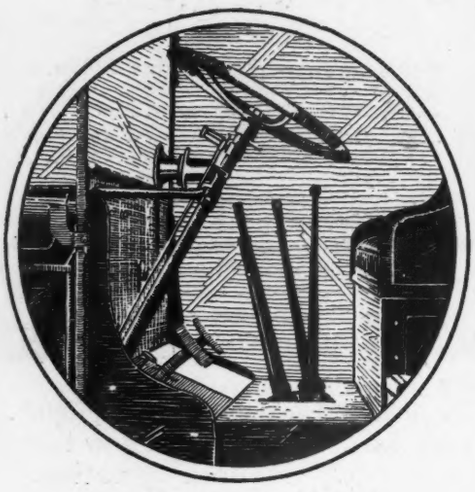
Catalog listing all of the famous Walker Badger Line—"A Jack for Every Job"—upon request. Send for it today.

WALKER MFG. CO.
30 Hamilton St. RACINE, WISCONSIN



WALKER BADGER TRUCK JACKS

A Marvel of Power *and* Speed



The SCHACHT TRUCK *with* TEN SPEED TRANSMISSION

The First Five-Ton Truck Ever Built That Combines Both Maximum Speed and Maximum Power

DRIVERS *will* make time on asphalt or concrete when the road is open before them, and this transmission lets them do it without high motor speed with its wracking vibration, overheating trouble, rapid deterioration and heavy repair expense. The Schacht Ten-Speed Transmission is practically two transmissions in one. You can go wherever your wheels will get traction.

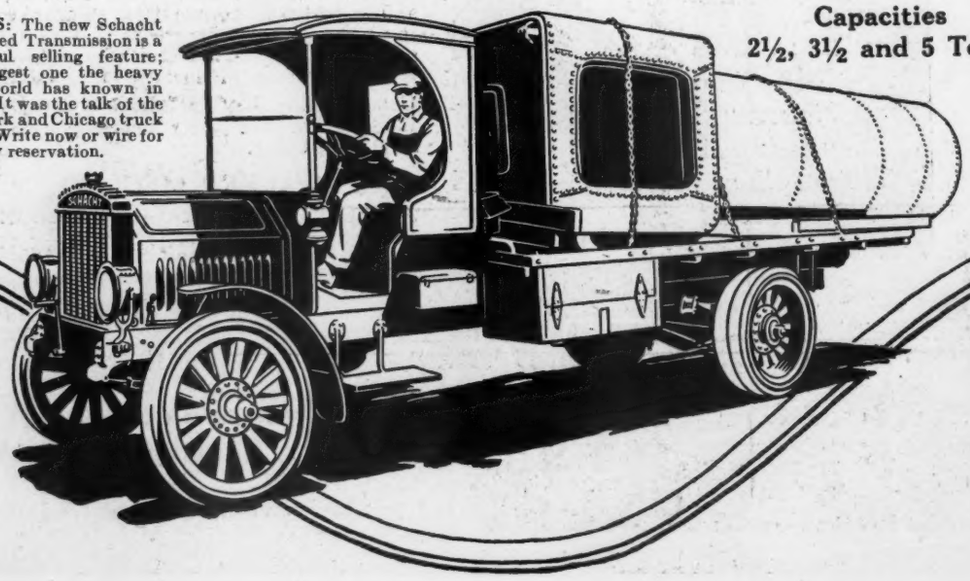
The truck gets over the road faster, makes more trips—and lasts longer with lower expenses for repairs and upkeep

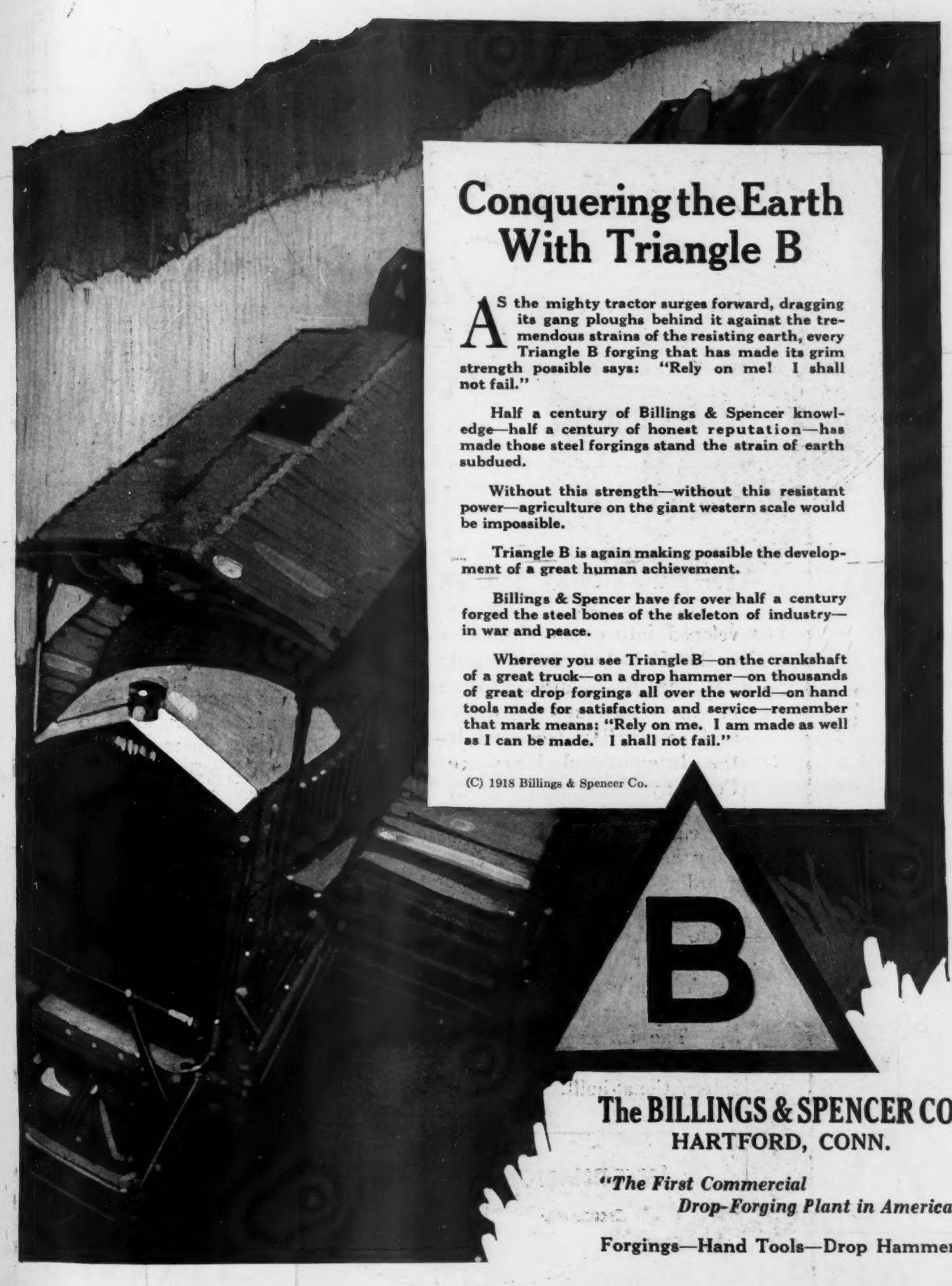
THE G. A. SCHACHT MOTOR TRUCK CO. CINCINNATI, OHIO

Branches: New York, 422 E. 54th St.—Chicago, 2021 Michigan Ave.

DEALERS: The new Schacht Ten-Speed Transmission is a wonderful selling feature; the biggest one the heavy truck world has known in years. It was the talk of the New York and Chicago truck shows. Write now or wire for territory reservation.

Capacities 2½, 3½ and 5 Tons





Conquering the Earth With Triangle B

AS the mighty tractor surges forward, dragging its gang ploughs behind it against the tremendous strains of the resisting earth, every Triangle B forging that has made its grim strength possible says: "Rely on me! I shall not fail."

Half a century of Billings & Spencer knowledge—half a century of honest reputation—has made those steel forgings stand the strain of earth subdued.

Without this strength—without this resistant power—agriculture on the giant western scale would be impossible.

Triangle B is again making possible the development of a great human achievement.

Billings & Spencer have for over half a century forged the steel bones of the skeleton of industry—in war and peace.

Wherever you see Triangle B—on the crankshaft of a great truck—on a drop hammer—on thousands of great drop forgings all over the world—on hand tools made for satisfaction and service—remember that mark means: "Rely on me. I am made as well as I can be made. I shall not fail."

(C) 1918 Billings & Spencer Co.

B

The BILLINGS & SPENCER CO.
HARTFORD, CONN.

"The First Commercial Drop-Forging Plant in America"

Forgings—Hand Tools—Drop Hammers



EVERY day the great American fleet of **International Motor Trucks** threads over city street and country road, unraveling nearly 2,000,000 dependable miles from the limitless fabric that is **International Service.**

INTERNATIONAL MOTOR TRUCK haulage has developed into a powerful factor in the efficient conduct of nearly 200 lines of business, because of the traditions of worth and reliability treasured by the International Harvester Company.

For eighty-nine years this company has been gaining in skill, guarding and never lowering standards, while manufacturing high-grade machines. For fifteen years it has been expending skill and experience in building engines for heavy-duty service. The trucks it offers are International-designed and International-built.

Wherever you see an International at work (recognize it by its distinctive sloping hood) you may learn a chapter in International truck success. One concern alone today has over 1800 International trucks in its service. Fleet owners analyzed and compared and knew the facts, you may be sure, before they invested in **International Motor Trucks** as the best solution of their transportation problems.

International sizes range from ¾ ton to 3½ ton. Whatever the requirements, these trucks and International Service are fitted to fill the bill. The future for International truck and dealer is one of undoubted success.

Motor Truck Department

INTERNATIONAL HARVESTER COMPANY
OF AMERICA INC.

CHICAGO U S A

Material





The basis of WARNER *Quality*

Careful inspection, exhaustive laboratory tests and comprehensive records maintain a high standard of excellence in Warner Gear materials.

Steel bars are bored and the drillings used for laboratory testing. Sections of bars are numbered serially and painted with a code color—each successive piece as it is cut off carries its own record—*because*, at Warner Gear, every assembly must have perfect gears of proper steel, each specially heat treated to its own engineering specifications. That is one reason why Warner Gears do not fail in service.

Warner Gear Company
Muncie, Indiana

WARNER

GEAR COMPANY
MUNCIE INDIANA

MEAD-MORRISON SERVICE

LIFTS THE LOAD OF INDUSTRY

Reducing trucking costs by decreasing idle time in loading and unloading—distinctly an engineering problem. That the Mead-Morrison staff of engineers have so successfully solved this problem is but another demonstration of their ability as specialists in material-handling equipment.

MEAD-MORRISON Truck Winches

Either the Vertical Capstan or Friction Drum type, satisfactorily meets every demand of truck users who must economically and speedily handle heavy, bulky loads.

Pulling a big smoke stack up into position, as in the job illustrated, is but one of the hundreds of unusual and difficult jobs where the Mead-Morrison Truck Winch demonstrated it will reduce the cost. It proves its exceptional worth on the "out of the ordinary" jobs.

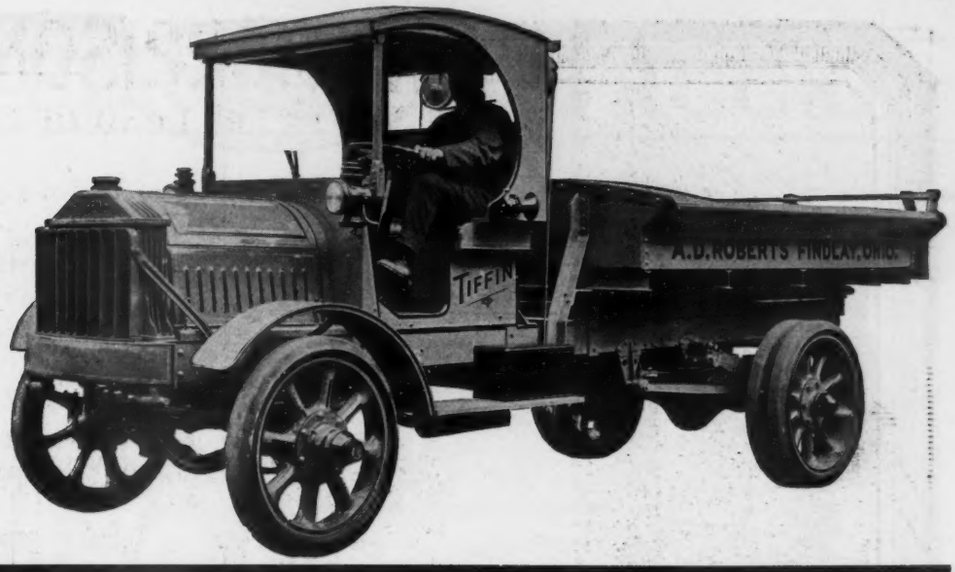
The Mead-Morrison Motor Truck Winch folder conclusively proves there is a real saving when you "let the engine do the work." Send for one.



MEAD-MORRISON
MANUFACTURING COMPANY
322 Prescott Street
East Boston Mass.

REGISTERED IN UNITED STATES PATENT OFFICE
MM&M

For the Dealer who believes that quality triumphs



TIFFIN

1½ to 6 tons

The manufacturing methods employed in building Tiffin Trucks are old-fashioned in the same sense that the production practices on Atkins Saws or Remington Fire Arms are old-fashioned.

Tiffin Trucks are built in a factory that knows thorough-going quality by the time-tried standards of the nineteenth as well as the twentieth century.

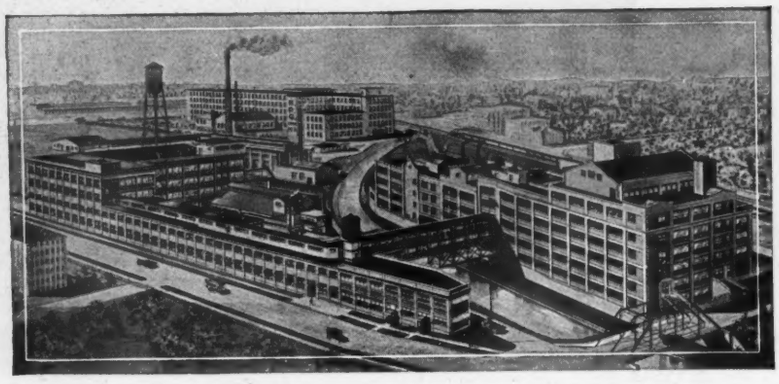
In the long run, the dealer wins who handles a truck as sound and honest and serviceable as the TIFFIN.

Tiffin dealers don't always make money as fast at first, but if they believe in the quality basis of selling, they make more money over a period, also they build themselves a permanent business because their foundation stone is service to customers.

We will be glad to hear from dealers who want a proposition of this type.

The TIFFIN WAGON COMPANY, Tiffin, Ohio

Makers, also, of Tiffin Motorized Street Flushers and Municipal Vehicles



The ten-acre plant of the New Process Gear Corporation

Gear Economy

When you lay out the gearing for your car, truck or tractor, why not take advantage of our standardized gear-designs? Why not employ gears for which we are completely "tooled"?

We have manufactured to a large range of specifications and dimensions and in large volumes. No question about the "rightness" of these gears—they are service-proven.

And you can bank on the uniform exactness of New Process Gears to keep your assembly costs down and assist in the economical operation of your product.

Our engineers are ready to confer with you.

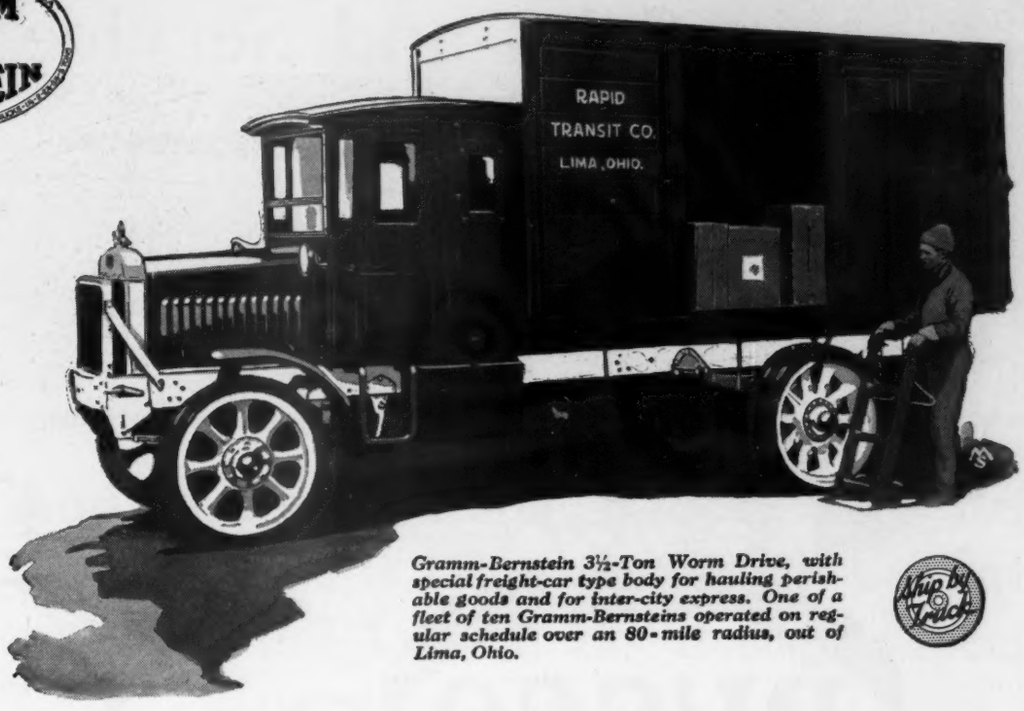
Quality — Quantity — Quickness

New Process Gear Corporation

Syracuse *Member of the* New York

New Process Gears

GRAMM-BERNSTEIN TRUCKS



Gramm-Bernstein 3½-Ton Worm Drive, with special freight-car type body for hauling perishable goods and for inter-city express. One of a fleet of ten Gramm-Bernsteins operated on regular schedule over an 80-mile radius, out of Lima, Ohio.

It Establishes Its Own Preference

The Gramm-Bernstein Truck is always worth its price.

It is not a difficult matter for the Gramm-Bernstein dealer to establish this fact.

It is all the easier because he is not obliged to justify price by comparison with other trucks.

The Gramm-Bernstein design contains certain fundamental patented superiorities.

These betterments give the Gramm-Bernstein truck the advantage, because they are not to be found in any other trucks.

The exclusive, constant-mesh transmission, the patented power take-off, the oilless universal joints, the radiator shroud, the complete equipment, and other individualities, in themselves, make the truck worth more.

The dealer does not have to waste time and effort in explaining away price differences.

He sells the Gramm-Bernstein Truck on its distinctive superiorities of construction and service, made possible by B. A. Gramm's twenty years of development in the organization and the building of better trucks.

Because the dealer does not have to enter competition, he establishes Gramm-Bernstein preference more quickly and with greater profit and reputation to himself.

All Gramm-Bernstein Transmissions are trouble-proof and are provided with a pad for attaching Gramm's Basic Patent Power Take-off. Dealers and truck owners should assure themselves that any trucks purchased with power take-off do not infringe B. A. Gramm's Basic Patent No. 1194994

The Gramm-Bernstein Motor Truck Co., Lima, Ohio

Pioneers Since 1901—Builders of the First Liberty (U. S. A.) Truck

The Brake Lining that's Sure in Sales and Service



RUSCO Brake Lining and Clutch Facings

They give satisfaction alike to the dealers who sell them and to the motorists who use them.

Rusco Brake Lining is woven of the finest white asbestos, reinforced with brass wire and treated with Rusco Brake Lining Compound.

Rusco Advertising, with the one year guarantee, is leading more and more motorists to Rusco Dealers, and Rusco quality makes them steady customers.

Write our nearest office for information.

THE RUSSELL MANUFACTURING CO.

Established 1830

38 Factory Buildings—25,000 Shuttles

522 Russell Avenue Middletown, Connecticut

Branch Offices:

New York, 349 Broadway Chicago, 1438 Michigan Ave.

Atlanta, 60 S. Forsyth Street Detroit, 226 Jefferson Ave., E.



Any Good Business Man Will Gladly Pay You to Show Him How He Can Save One-Third of His Haulage Expense

Studebaker Corporation Saves $14,000 Per Year With Fruehauf Trailers

Mr. John Sullivan, Supervisor of Transportation for the Studebaker Corporation, told the Truck Owners' Conference how he uses Fruehauf Trailers. He said:

"We so routed and scheduled the hauling to our Walkerville plant that we could use our five trailers and are saving $14,000 per year of hired hauling."

Saved $8,100 on One Job

"Our first job was moving 6,000 tons of service stockroom material ¾ of a mile. The trucking company's price was $8,900.

We bought five 4 ton Fruehauf Semi-Trailers and with an old 1 ton power unit hauled that 6,000 tons in the time required at an operating cost of $800, saving $8,100 on that one job. This would pay for the trailers twice over."

What Fruehauf Trailers are doing for the Studebaker Corporation is similar to their performances for others. Better send for our catalog.

Haulage is one of the big items of expense in every business. It has increased tremendously in the last two years.

But factories, contractors, wholesalers and all other businesses must maintain their delivery and trucking facilities.

Every day they are buying transportation, and trying to keep down the cost of haulage. That is why they can quickly see the value of

FRUEHAUF TRAILERS



A Fruehauf Trailer makes a 6 ton carrier of a 2 or 2½ ton truck—makes one trip do the work of two or three ordinary trips with the truck alone.

The first cost of truck and Fruehauf Trailer combination is about two-thirds the cost of a truck with equal carrying capacity. The maintenance cost is very little more than for the truck alone.

Fruehauf Trailers enable dealers to sell what every business house needs—real transportation at a real saving.

Send for the Fruehauf Catalog. Four-Wheel and Semi-Trailers 2 to 12 Ton Capacity

FRUEHAUF TRAILER COMPANY
1302 Gratiot Avenue **Detroit, Michigan**



"OLD HICKORY"

The best advertising a motor truck can have is its ability to give honest, satisfactory service under all conditions.

It is this kind of advertising, principally, that is continually increasing the good-will and profits of Old Hickory dealers everywhere.

And, as a dealer, you will appreciate this: Old Hickory Trucks are backed by a 40-year-old organization of prestige and permanence that co-operates with and protects its dealers at every stage of advancement.

Wire for Particulars

Kentucky Wagon Manufacturing Co., Inc., Louisville, Ky.



Herculean Tasks

Daily, hourly the big motor trucks of America are called upon to perform giant tasks.

And the huge monsters shoulder their burdens, carry them, dump them and come back for more. Hour after hour they labor restlessly. The demands of industry and commerce are ruthless and insistent.

It is a tribute to America's foremost truck engineers that America's foremost motor trucks —large and small—are equipped with worm-gear drives.

This unanimity of opinion on the part of the pioneers of the industry speaks strongly and effectively for the worm-gear drive.

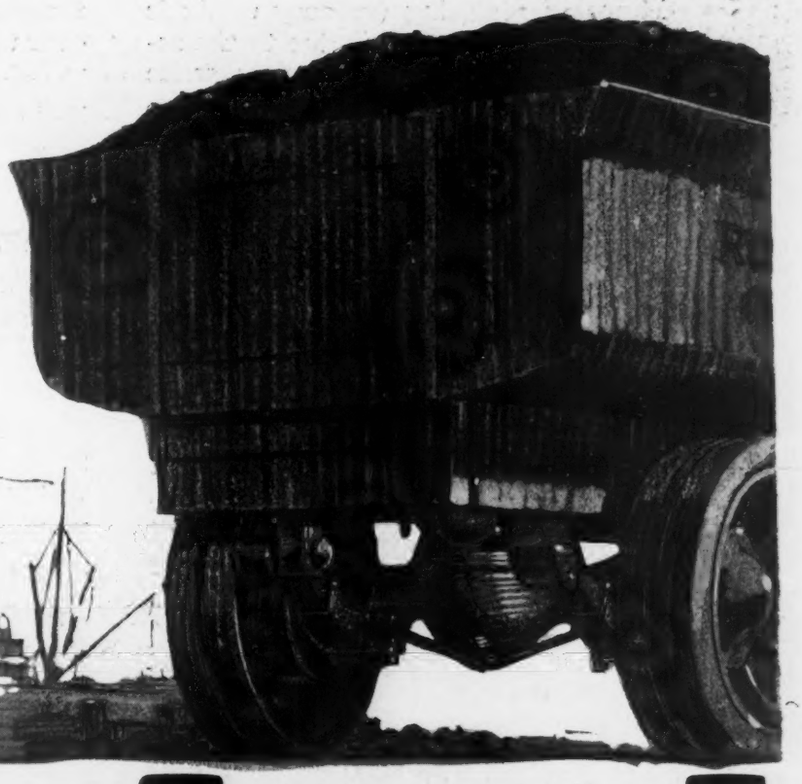
The Cleveland Worm Gear Co.

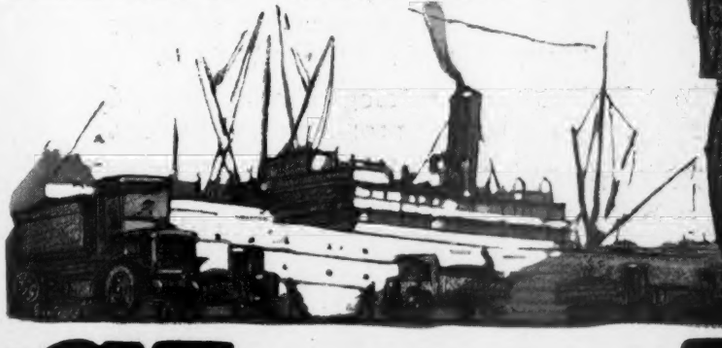
America's Worm Gear Specialists

Cleveland, Ohio

C. F. Quicke & Co.
315 Euston Rd., London, N. W.

Alfred H. Coates Co.
41 Spear St., San Francisco, Calif.

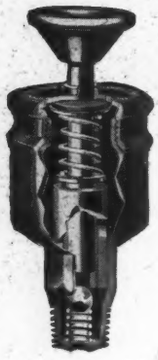




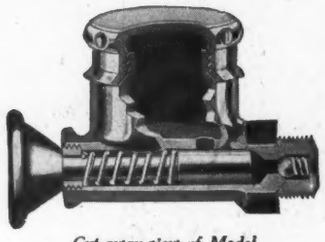
Cleveland WORM GEARS

OTHER GEARS WEAR *OUT*, THE WORM GEAR WEARS *IN*.

Fitting all cars with Kipp-adapters



Cut-away view of Model "H" Oil-Kipp for Steering Knuckles and other vertical positions.



Cut-away view of Model "K" Oil-Kipp for Spring Pins and other horizontal positions. Kipp-Adapters fit Oil-Kipps to any make of truck or car.

Much of the immediate success of Oil-Kipps in replacing ordinary methods of chassis lubrication is due to the remarkably simple and complete series of Kipp-adapters.

Because of these adapters, Oil-Kipps can be quickly applied on any model of car or truck, to silence squeaks and make steering easy.

Oil-Kipps are small magazine force-pumps that one filling from the oil-can loads with about twenty shots of heavy oil.

By simply snapping their spring plungers, you can lubricate your chassis in three minutes—without dirt or bother.

Where grease cakes and gums—where ordinary oil cups fail because the drill holes of the bolts get clogged by dirt—Oil-Kipps unfailingly shoot their oil through the smallest drill holes and over the snuggest bearing.

By applying them to the spring bolts, you stop the squeaks that gnaw away at spring bolts and cause rattles and bumpy riding.

By using them on the steering knuckles, you make steering easy.

The Kipp-adapters make the application of Oil-Kipps a very simple matter.

They also make it easy for garages and dealers to carry an adequate stock.

A moderate supply of Oil-Kipps and full sets of the inexpensive adapters will take care of every kind of car.

Write for our catalog of adapters and for our Oil-Kipp proposition to dealers.

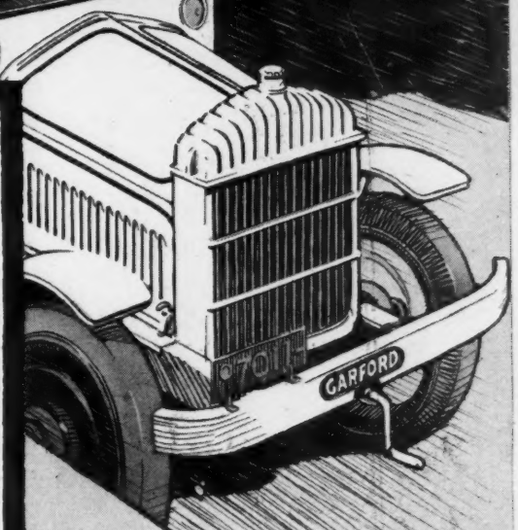
MADISON-KIPP CORPORATION
Madison, Wisconsin

Madison Kipp

Oil-Kipps

KEEP CARS NEW





"Users Know"

GARFORD'S nationally known phrase, in summing up the evidence for this rugged, dependable truck, also speaks with equal force for its driving and supporting mechanism—a rigid, self-contained unit, simple and strong, which requires no re-adjustment and is enclosed in a dust-proof and oil-tight housing.

Fifty-five well-known American motor trucks testifiy to Timken-Detroit dependability.

Abbott & Downing	Dorris	Master	Signal
Acason	Fageol	Michigan Hearse	Southern
Ace	Federal	Minneapolis	Standard
Acme	Garford	Moreland	Sterling
*Ahrens-Fox	G. M. C.	National	Sullivan
Armleder	Gary	Nelson & LeMoon	Tegetmeier & Riepe
Atterbury	Hahn	New England	Tower
Available	Hendrickson	Oneida	Ward-LaFrance
Brinton	King-Zeitler	Paige-Detroit	Walker-Johnson
Brockway	Kissel	Parker	White Hickory
Chicago	Kleiber	Sandow	Witt-Will
Clydesdale	Koehler	*Seagrave	Wilson
*Denby	Lewis-Hall	Selden	
Diamond T	Locomobile	Service	
	Maccar		

Front Axles

THE TIMKEN-DETROIT AXLE CO.
Detroit, Michigan

TIMKEN-DETROIT AXLES

"The Spring is the Thing"

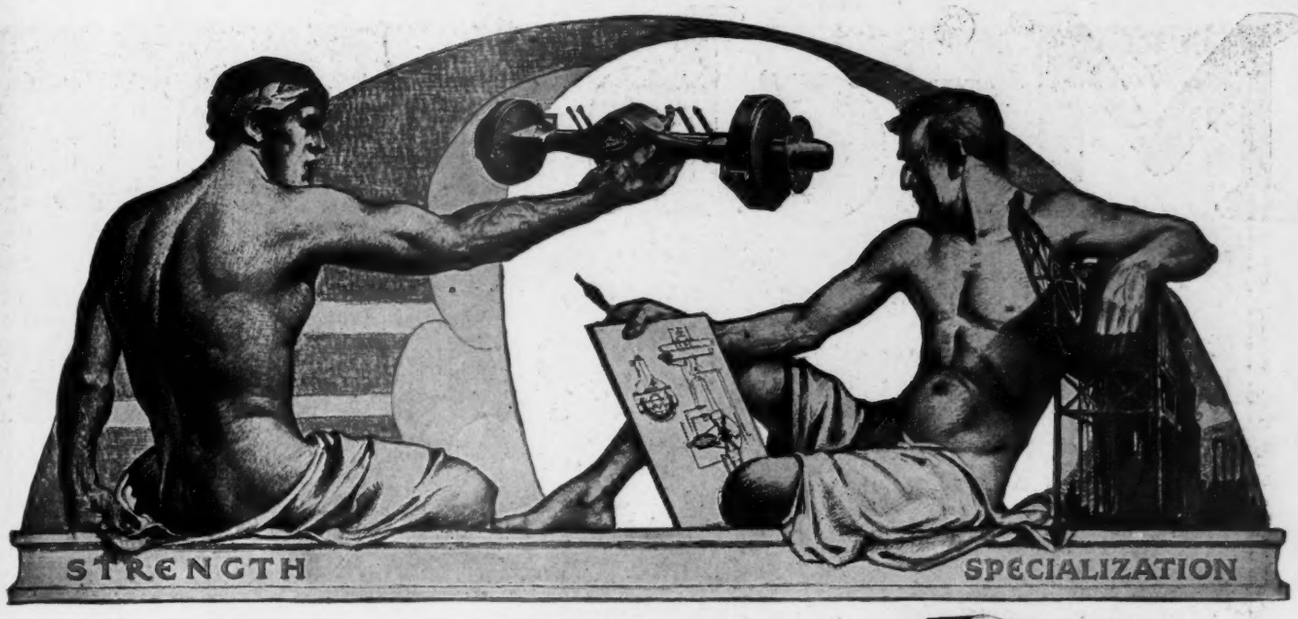


MATHER SPRINGS

Scientifically Heat-Treated

Unequalled for
Lightness, Flexibility
and Endurance

Genuine made only by
THE MATHER SPRING COMPANY
Toledo, Ohio





Built with minds on One problem —one problem Alone

CONFRONTED by new conditions, the world today as never before, calls for concentration of thought and purpose in its industries.

Time—and these times in particular—only serves to emphasize the need for Specialization with its inevitable outcome—betterment of product.

For years we have been manufacturing Internal-Gear-Drive Axles for Commercial Cars.

From our exceptional experience and specialization in this field, we have developed many improvements, and shown marked advance in this type in which we have long been large producers.

The load-carrying member is a Tubular Housing formed from *one* piece of steel with but *one* weld, and consequent greater strength for its weight, torsionally and in carrying both vertical and horizontal loads.

Wheel **Spindles** are nearly double the usual strength of such members.

And many other improvements, less conspicuous but equally vital, are also the result of our experience and specialization.

We manufacture front axles of the conventional type in sizes to accompany the rear axles.

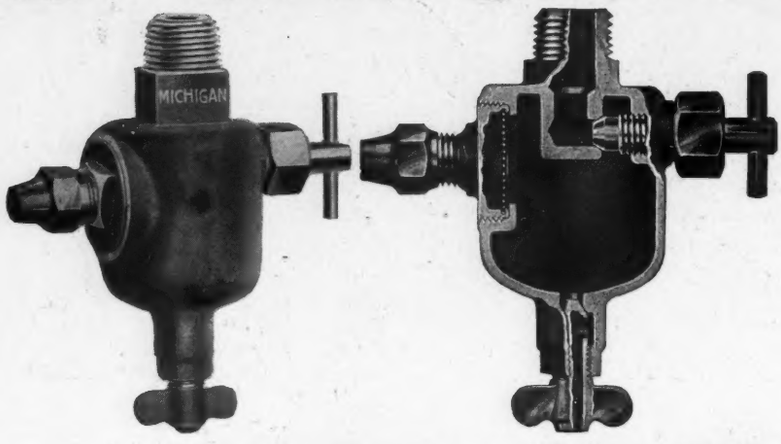
Front and rear axles of 1½ and 2½ ton sizes are in production, with 3½ and 5 ton sizes to follow.

We will be glad to hear from manufacturers and others interested in Commercial Car Axles.

Columbia
Internal Gear Drive
Axles

THE COLUMBIA AXLE COMPANY · CLEVELAND OHIO · USA

Michigan



Sediment Traps

For the Truck Maker Who Buys the Best

















Model 25F Sediment Trap

Plain Type

It is very desirable that the fuel system on all internal combustion engines using carburetors be provided with an effective strainer, or better yet, a Sediment Trap. Unless one of these devices is used, much annoyance and inconvenience will be caused by grit and water in the fuel, clogging the needle valve and otherwise interfering with the proper operation of the carburetor. The Sediment Trap, in addition to having a strainer (built into the outlet flange), has a settling chamber that collects water, which a mere strainer will not.

Model 25F Sediment Trap screws directly into the fuel tank. The outlet, or carburetor connection, is on the side. This trap is equipped with a needle valve shut-off, which completely shuts off the fuel supply. The stem of this shut-off valve is packed with woven asbestos packing, which is greatly superior to ordinary asbestos packing. The sediment chamber is equipped with a needle drain valve for draining off the grit and water collected from the fuel. The outlet flange is removable, giving access to the strainer screen for cleaning. The strainer screen is 70 mesh wire gauze.

Model 25F Sediment Trap is very strongly built to withstand severe usage, and yet is quite compact, being only 4½" tall. Packed one in a carton.

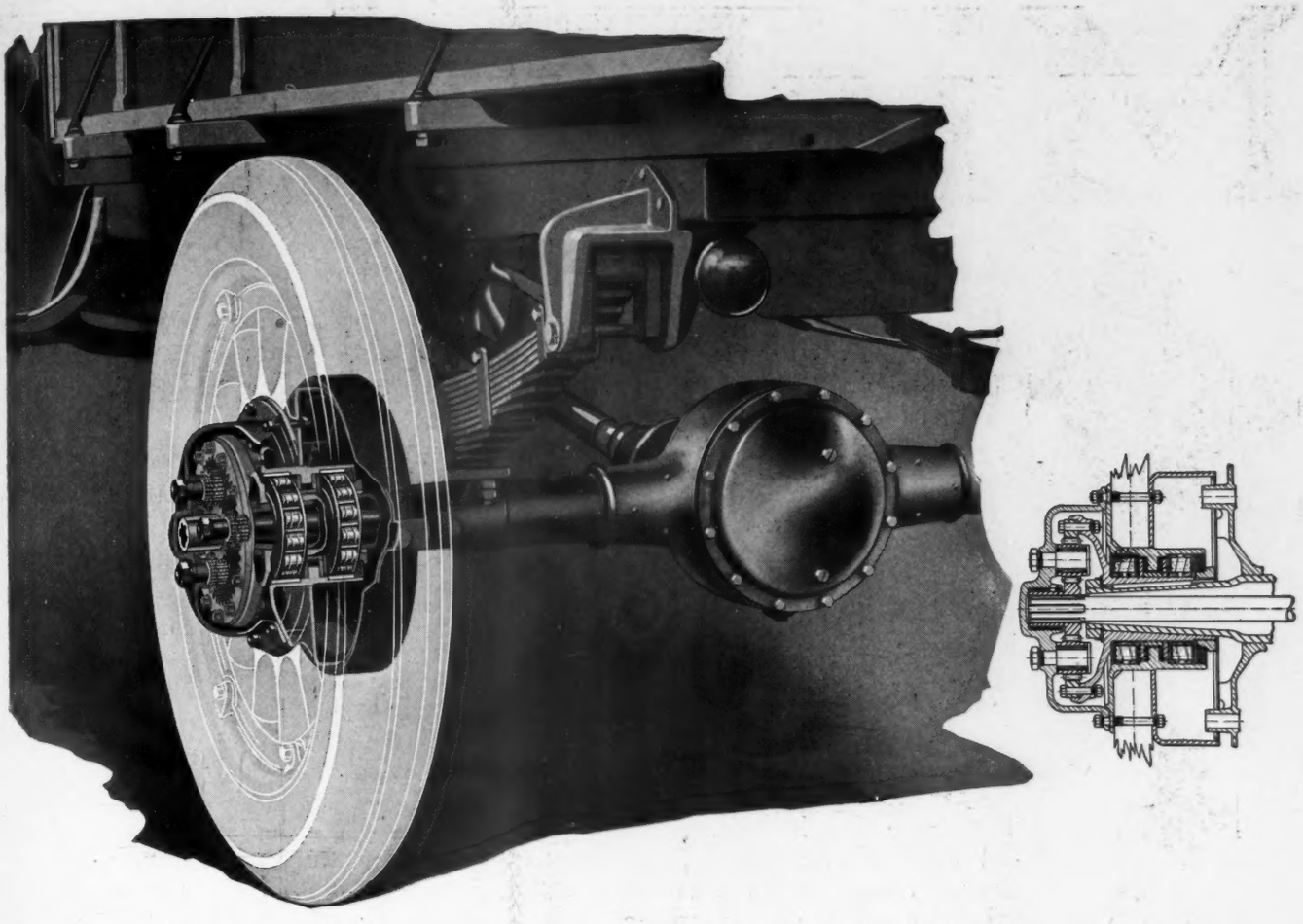
Made in Three Sizes as Follows:

No.	Pipe Thread	Tube Size	List Price
25F41	½	¼	$2.00
25F42	½	5-16	2.00
25F43	½	3-8	2.00

NOTE—We do not do a retail business

MICHIGAN LUBRICATOR COMPANY

DETROIT, MICHIGAN, U.S.A.



Hyatt Bearings Are Dependable

Wherever Severe Service Must Be Encountered

Bearing requirements must be properly met in this planetary type of double reduction internal gear axle hub—that is why Hyatt Bearings have been used.

In the planet gears, Hyatt Roller assemblies running on hardened pins and directly in the bores of the gears keep them in proper alignment under severe and constant loads.

The large high duty Hyatt Bearings between the wheel hub and the axle housing support the load and keep the wheel in position. Proper thrust plates care for the thrust loads.

Hyatt Roller Bearing Company, ***Motor Bearings Division,*** **Detroit, Michigan**

HYATT QUIET BEARINGS

Watch the Rowe in Action

Stand aside and critically watch a Rowe Truck in action, with or without a load. For smooth action and reserve power, it has no peer. The Rowe runs as smoothly as a limousine, without swaying or side motion. All the drive is forward, with no loss of power.

Even when the Rowe is empty it does not rattle and jolt as do many other makes, as depreciation is closely guarded against and forestalled by the Rowe design.

The Rowe line includes four models—2, 2½, 3½ and 5 ton capacities, which enable dealers to approach any class of truck prospects with the certainty that they can prescribe a Rowe model to meet every trucking need.

A Wisconsin Motor, Zenith Carburetor, Bosch Magneto, Sheldon Axle, Sheldon Springs, Ross Steering Gear and Simplex Governor, are a few of its splendid parts which we mention to convey an idea of its excellent construction.

All Rowe models are alike in design and construction, differing only in weight-carrying parts. This enables Rowe dealers to equip truck users with several models of various capacities and to assure them that the cost of maintenance and expense will be lowered considerably because of this uniformity.

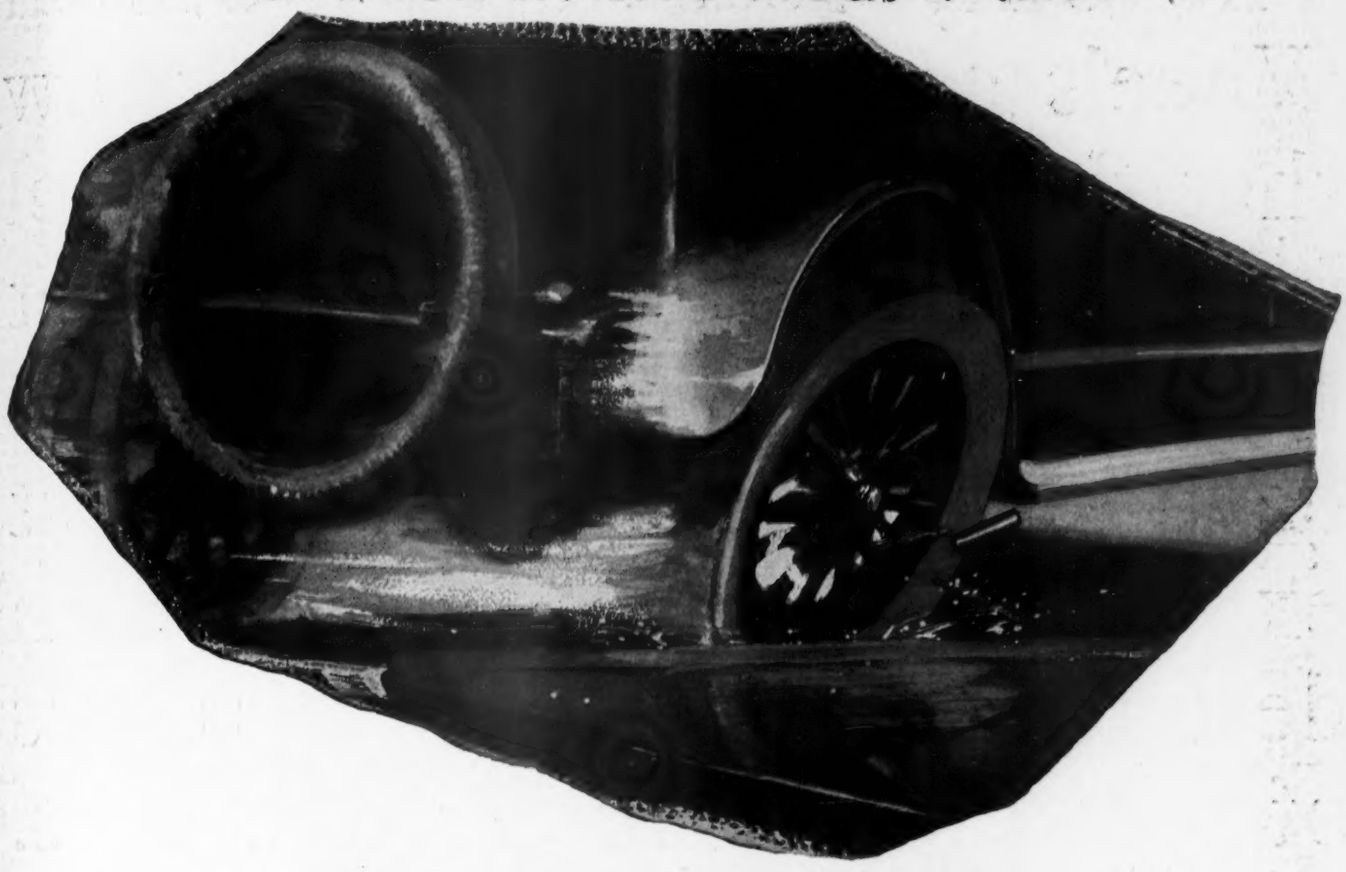
A few Rowe dealerships happen to be open now.

If you are interested, write us. We will tell you the Rowe story—how it was the Pioneer Worm Drive Truck of America and all that it stands for today. But to really appreciate the Rowe it is necessary to see it work, to take the wheel yourself and ride in it.

Rowe Motor Mfg. Co.

Lancaster **Pennsylvania**

Powrlok in the Rear Axle



Prevents Skidding

Powrlok at one stroke minimizes skidding—the greatest danger—and stops stalling—the greatest inconvenience in automotive travel.

This is accomplished by a simple, time-tried and proven mechanical principle, which *automatically* distributes the power to the rear wheels as it should be—in direct proportion to the traction or hold which they have on the ground—instead of in indirect proportion as the ordinary differential does.

Powrlok has been in actual use for over five years in upwards of 40,000 cars, trucks and tractors—invariably making good.

Upon examination, you will find it as simple and durable, as accessible and fool-proof as the finest differential ever built.

We believe no other device has ever met with such a unanimous approval by manufacturers. Over sixty manufacturers of cars, trucks, tractors and industrial trucks now use it as standard equipment.

Other questions are answered in our new booklet—"More Than a Differential." Ask for it.

Specify Powrlok in the rear axle when you buy any car, truck or tractor.

THE POWRLOK COMPANY, 1107 East 152nd Street, CLEVELAND, OHIO

Foreign Representatives:

The Powrlok Company, Ltd. *Offices:* 24 Maddox St. Regent St., London, England 19 Avenue McMahon, Paris, France

POWRLOK

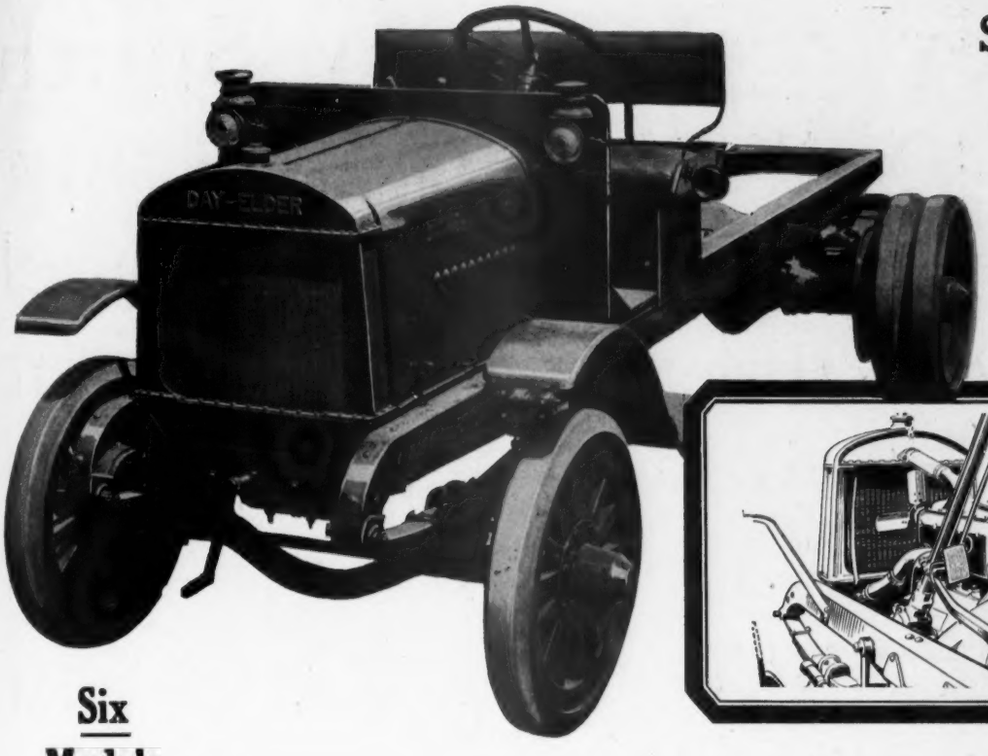
"More than a  differential"

For Motor Trucks, Passenger Cars, Tractors, Industrial Trucks, Axles and Transmissions

The only reason why Smith Wheels are hubless is: we know that the hub-cast integral wheel for motor trucks is not the right type of wheel for the purpose. We have learned this from our vast experience and observation in designing and building all kinds of metal wheels for various uses.

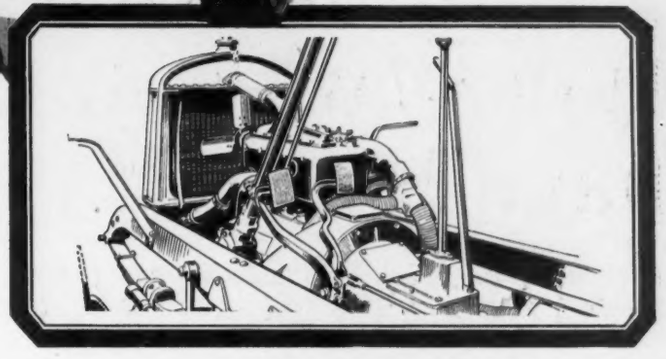
Smith Wheels are supplied to the truck maker when wanted. The making of trucks is not held up for lack of them. Our deliveries of Smith Wheels eliminate excuses and their service results and appearance also help to make their big sale.

Our desire is always to convince by ***facts.*** There is a world to be learned about ***metal wheels.***



SIX MODELS
1 to 6 Tons

MODEL F
3½ to 4 Tons
Chassis Carrying Capacity—Including Weight of Body—9000 Pounds



Six Models

Model A
1-1½ tons
Capacity Including Weight of Body
3500 Pounds
$1925

Model B
1½-2 tons
Capacity Including Weight of Body
4500 Pounds
$2200

Model D
2-2½ tons
Capacity Including Weight of Body
6000 Pounds
$2600

Model C
2½-3 tons
Capacity Including Weight of Body
7000 Pounds
$2850

Model F
3½-4 tons
Capacity Including Weight of Body
9000 Pounds
$3550

Model E
5-6 tons
Capacity Including Weight of Body
14,000 Pounds
$4500

Noted for Its Sturdy Dependability

DAY-ELDER quality and value are dependable because they are constant. Each finished part must meet the high standard of construction and workmanship that is set for it. This is why DAY-ELDER motor trucks are so widely esteemed for their dependable durability.

In choosing a motor truck, the buyer can safely waive, individually, this feature and that one, this new departure or that time-tried device. The final, deciding criterion is the consistent, dependable quality of all parts, reflected in a *performance* that meets all requirements. This alone reveals the aggregate worth of all features, design, construction and materials combined.

You as a dealer are interested in indentically the same qualities in a truck as your customer, *plus* a real, two-fisted opportunity that will stand all the development you are capable of giving it. The DAY-ELDER franchise affords you this and the assurance that your customer will still be your friend for years after he signs the order.

A postcard will bring you our latest literature. Send for it.

DAY-ELDER MOTORS CORPORATION
FACTORY: NEWARK, N. J., U. S. A.
Detroit Office: 506 Free Press Building

DAY-ELDER
Worm-Drive Motor Trucks

WDF
Quality Forgings

QUALITY
DROP FORGINGS

FOR

AUTOMOTIVE CONSTRUCTION

SPECIALISTS IN THE MANUFACTURE OF

I-BEAM FRONT AXLE FORGINGS

WESTERN DROP FORGE CO.

MARION, INDIANA



DIETZ "MONITOR" TRUCK LAMPS

(For Kerosene)

WHY THEY SELL

THE demand for Dietz *Monitor* Side and Tail Lamps has "just growed," like Topsy. But not without reason—there are always reasons and here are a few:

1. When lit they stay lit.
2. They stand up under road pounding.
3. Suitable for use on either heavy or light tonnage trucks.
4. Moderate price.

Dietz *Monitor* Side and Tail Lamps are 9¾ inches high. They give an 8 candle-power light for 14 hours. Equipped with an unlosable inside oil fount. Side lamps have a powerful optical lens.

Send for Catalog

R. E. DIETZ COMPANY 60 LAIGHT STREET, NEW YORK

Founded 1840

JAMES BARNES, Sales Manager, Motor Truck Lamp Dept., Carter Bldg., Rochester, N. Y.



Fleet of 27 Highway Trailers in Service of the U. S. Navy Department

Note Sales Advantages of Highway Trailers

Standard Model Exclusively Accepted Without Change by the U. S. Army and Navy

Highway Trailers have gained a highly important place in truck transportation.

Experts agree they add 50% to hauling efficiency.

The United States Army and Navy, operating more than $1,000,000 worth, proved they cut haulage costs, in excess of rated truck capacity by 80% to 90%.

The remarkable growth of their use has created big money-making opportunities for dealers.

You can share in these profits. With a Highway Trailer franchise, your sales are limited only by the number of trucks in your territory.

Highway Pipe & Pole Trailers are in keen demand in the oil fields, steel industry and lumber centers. Trucks alone won't serve.

More than 180 lines of business employ Highway Trailers.

There is a type for any need.

Write for details.

Four Wheel High Speed Heavy Duty Reversible Type Trailers

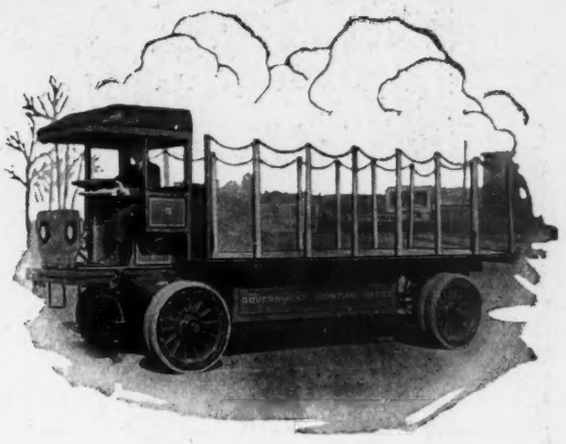
1½ TON Capacity	2½ TON Capacity	4 TON Capacity	6 TON Capacity
$725	$935	$1225	$1545

HIGHWAY TRAILER

EDGERTON WISCONSIN

THE ELECTRIC STORAGE BATTERY CO.

EFFICIENT, ECONOMICAL TRANSPORTATION



MORE and more, big industrial establishments are turning to the Electric Truck. Carefully gathered facts and figures by traffic experts show that in many classes of city and suburban delivery the "electric" is the most efficient as well as the most economical transportation unit.

The upkeep of the "electric" is low. It is seldom wasting time and money in the repair shop. Its average life is well over ten years. It can be operated and cared for by unskilled labor, and can be stored on the premises without further existing insurance rates

The "Ironclad-Exide" Battery

combines all the features required in storage battery equipment for Electric Truck Service.

The "Ironclad-Exide" Battery:

Is Powerful	Is Easy to Care For
Is Efficient	Has Low Upkeep Cost
Is Rugged	Has Long Life

Is Assembled in Guaranteed "Giant" Jars

The "Ironclad-Exide" Battery is used in modern submarines of the U. S. Navy, in Mine Locomotives, in Industrial Trucks and Tractors—it is the right battery for *your* Trucks.

THE ELECTRIC STORAGE BATTERY CO.

The largest manufacturers of storage batteries in the world

1888 PHILADELPHIA, PA. 1920

New York Boston Chicago Denver San Francisco St. Louis Cleveland Detroit Washington Minneapolis
Kansas City Atlanta Pittsburgh Rochester

Special Canadian Representatives: Chas. E. Goad Engineering Co., Toronto, Montreal

THE ELECTRIC STORAGE BATTERY CO.

CERTIFIED MALLEABLE CASTINGS
THE AMERICAN MALLEABLE CASTINGS ASSOCIATION
ACA CERTIFIED

Its Use is Universal *and* Varied

Have you considered it for any of your equipment? You owe it to yourself and your product to at least investigate its application.

Write any of the firms to whom certificates have been issued for the 4th quarter of 1919.

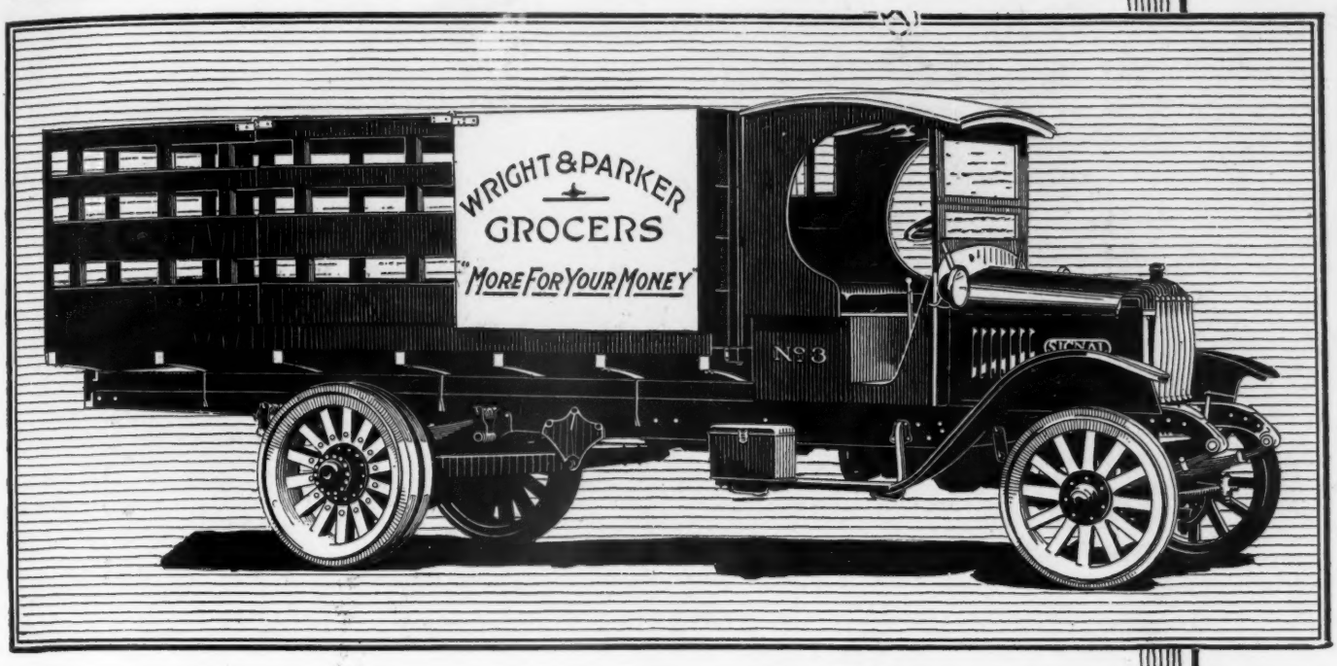
Albion Malleable Iron Co., Albion, Mich.
Chicago Malleable Castings Co., West Pullman, Chicago, Ill.
Columbus Malleable Iron Co., Columbus, Ohio
Chain-Belt Co., Milwaukee, Wis.
Danville Malleable Iron Co., Danville, Ill.
Dayton Malleable Iron Co., Dayton, Ohio and Ironton, Ohio
Eastern Malleable Iron Co., Bridgeport, Naugatuck, and New Britain, Conn.; Troy, N. Y.; Wilmington, Del.
Erie Malleable Iron Co., Erie, Pa.
Fort Pitt Malleable Iron Co., Pittsburgh, Pa.
Frazer & Jones Co., Syracuse, N. Y.
Illinois Malleable Iron Co., Chicago, Ill.
Iowa Malleable Iron Co., Fairfield, Iowa
Laconia Car Co., Laconia, N. H.
Marion Malleable Iron Works, Marion, Ind.
Missouri Malleable Iron Co., E. St. Louis, Ill.
National Malleable Castings Co., Chicago, Ill.; Indianapolis, Ind.; Cleveland, Toledo, Ohio
Northern Malleable Iron Co., St. Paul, Minn.
Northwestern Malleable Iron Co., Milwaukee, Wis.
Pittsburgh Malleable Iron Co., Pittsburgh, Pa.
Rockford Malleable Iron Works, Rockford, Ill.
Ross-Meehan Foundries, Chattanooga, Tenn.
St. Louis Malleable Castings Co., St. Louis, Mo.
Stowell Co., South Milwaukee, Wis.
T. H. Symington Co., Rochester, N. Y.
Terre Haute Malleable & Mfg. Co., Terre Haute, Ind.
Vermilion Malleable Iron Co., Hoopeston, Ill.
Wanner Malleable Iron Co., Hammond, Ind.

The American Malleable Castings Association

1900 Euclid Ave.
CLEVELAND, OHIO, U. S. A.



You can get a Signal for YOUR Business



The Record Of the Signal

Signal history began in the pioneer days of the motor truck industry and the pages of this history disclose a record of which we are justly proud.

Never has the urge of large production dimmed the factory's vision of perfection of the Signal product.

As a consequence of this in-built perfection each Signal Truck produced has upheld the record of the first Signal of being "Always On The Job."

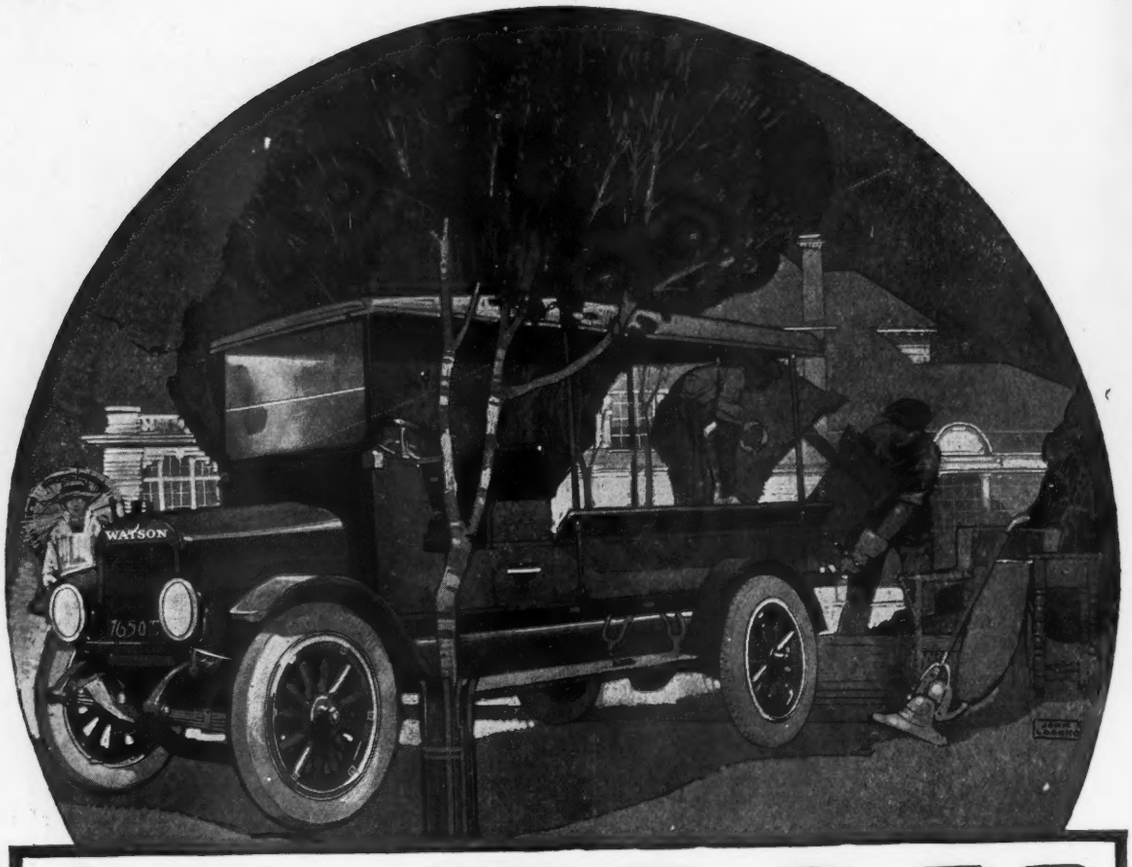
Naturally the Signal franchise has been made invaluable to dealers through the faith of Signal owners who are continually recommending the Signal to their associates.

1 to 5 Ton Capacities

SIGNAL

SIGNAL MOTOR TRUCK COMPANY

DETROIT



WATSON TRUCKS

RUGGED STRENGTH

Anyone, anywhere on the face of the globe, who knows Watson hauling equipment, will unhesitatingly say that Quality and Rugged Strength have been consistent characteristics of Watson products throughout the 31 years of Watson history.

The same reputation that attaches to the Watson Road Tractors, Trailers and Dumping Wagons is now accredited the line of Watson Motor Trucks.

Built by a concern with 31 years of success behind it, and offering a complete line of haulage equipment, soon to be aggressively advertised, the Watson contract holds many sound advantages for the Dealer who aims to build business permanently.

Write for full particulars.

Watson Products Corporation

Main Office and Plant, Canastota, N. Y.

WATSON MODEL B

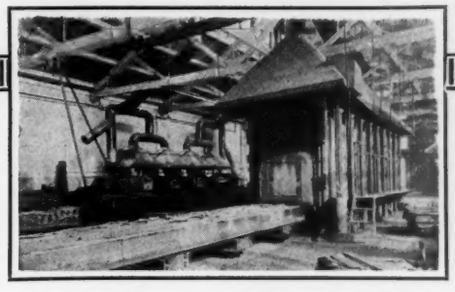
For All Light, Quick Hauling

Motor, 4-cylinder, 3¾" x 5¼".
Speed, 30 miles an hour.
Worm gear drive.
Wheelbase, 128".
Starting and Lighting System.
Tires, 34 x 4½ pneumatic, non-skid rear.
Extra long springs.
¾–1 ton, with reserve capacity that practically eliminates evils of overloading and meets severest conditions of road and grade. Rugged, durable, dependable, for uninterrupted, long-time service.

WATSON
HAULAGE SYSTEMS
MOTOR TRUCKS
ROAD TRACTORS
DUMPING WAGONS
& TRAILERS
WATSON PRODUCTS CORPORATION CANASTOTA, N.Y.

Parish & Bingham

FRAMES AND PRESSED STEEL PARTS





Are the Result of Predetermined Knowledge

With complete understanding concerning the faults that are common with ordinary frames, Parish & Bingham production is designed to eliminate these weaknesses in Parish & Bingham products.

It is not any degree of chance that prevents Parish & Bingham Frames and Pressed Steel Parts from rarely cracking, warping or sagging—it is the absence of flaws and imperfections, eliminated during production.

Two factors enter into the production of Pressed Steel Products—material and formulas. In the former, the character of the special analysis carbon steel is carefully tested and determined, and in the latter, our chemical laboratory works out the necessary degrees of heat treatment, etc.

Nothing is left to chance. All guesswork is eliminated. Basing our results on scientific analysis and research, we have had the infinite satisfaction of witnessing our products used under the most trying conditions in all parts of the world, without a single comeback or complaint.

If you value the certainty of known quality in Frames, Brake Drums, Axle Housings, Torque Arms, Step Hangers, Engine Reinforcements and Brackets, etc., rely on Parish & Bingham. Our plant expansion, now under way, may enable us to co-operate with you. Write us.

PARISH & BINGHAM CORPORATION

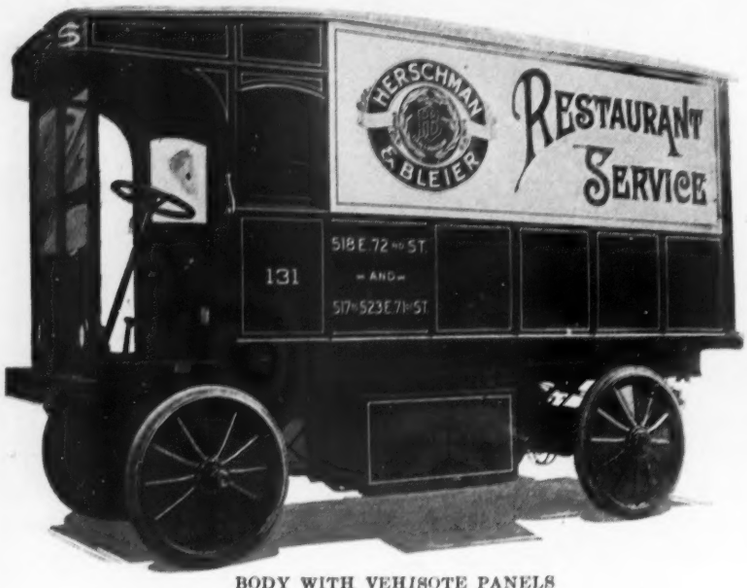
Cleveland, Ohio

P&B

VEHISOTE:

(Trade-Mark)

Efficiency
General Satisfaction
Economy



BODY WITH VEHISOTE PANELS
Built by Martin-Parry Corp., York, Pa.

VEHISOTE SIDE PANELS

Guaranteed not to split, crack or check. Think what this guarantee means to YOU!

Vehisote, like steel, is made by a fluxing process in which all the fibres run together, interlock and interlace so that it becomes all one homogeneous material in which there is no point of separation, no grain as in wood, no laminations as in built-up or stuck-together products. Therefore, it cannot check or split.

It is the nature of wood to split and crack under strain. How is this natural defect to be cured by gluing pieces of wood together?

Wood is wood, has always been and always will be.

THE PANTASOTE COMPANY

11 Broadway, NEW YORK

CHICAGO: Peoples Gas Building **DETROIT: Penobscot Building**

JOBBERS:

The Scovel Iron Store Co., San Francisco, Cal.
Sligo Iron Store Co., St. Louis, Mo.
E. D. Kimball & Co., Chicago
E. C. Kadow & Co., Chicago
E. J. Coyle & Co., Chicago
C. H. Tiebout & Sons, Brooklyn, N. Y.
N. Langler & Sons, Brooklyn, N. Y.
H. D. Taylor & Co., Buffalo, N. Y.
W. E. Kleine & Co., New York City
H. Hett & Sons, New York City
W. T. Crane Carriage Hardware Co., Newark, N. J.
Gerhab & Ludlam, Philadelphia, Pa.
John C. Hills, Trenton, N. J.
Mossman-Yarnelle Co., Fort Wayne, Ind.
Wm. Stockhoff, Louisville, Ky.

Standard
DETROIT USA



STANDARD SECURITY

What STANDARD Motor Trucks have done during the Ten Years of Motor Truck History we consider to be nothing Remarkable.

Motor Trucks—like anything else—Produce according to the Stamina Built in them. Thus STANDARD Performance is just as Sure, and STANDARD Stamina is just as Certain as Men, Money and Materials can make them.

Hundreds of Motor Truck Owners in Detroit alone have Backed STANDARD Stamina with an Investment of more than 1½ Million Dollars.

This Quiet, Steady Growth of the STANDARD Motor Truck Company is your Guaranty of STANDARD Security.

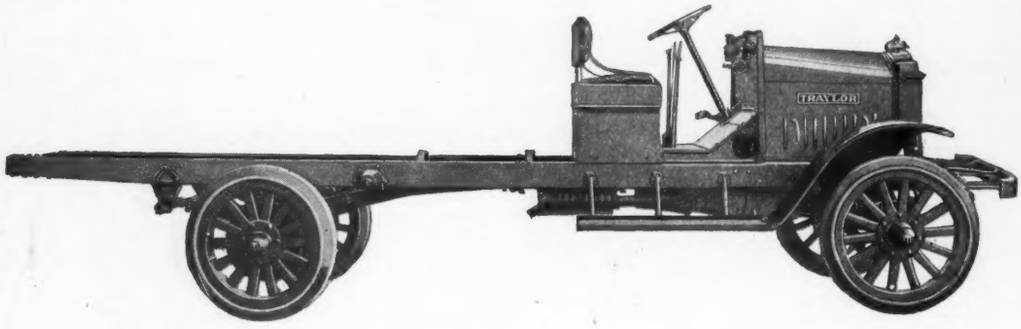
Dealers, Write for Territory

STANDARD MOTOR TRUCK CO., Detroit

Standard Registered MOTOR TRUCKS
MADE IN DETROIT USA

1, 2½, 3½, 5 Ton Capacities

"All the name implies"





2½-Ton Specifications

ENGINE—Buda Model HTU latest type for heavy duty work. Bore, 4¼ in.; stroke, 5⅝ in.

GOVERNOR—Pierce Governor.

CARBURETOR—Zenith.

IGNITION—Splitdorf Aero type magneto. Model 448, with enclosed automatic impulse starter.

RADIATOR—G. & O. make (square fin and tube removable core). Upper and lower tanks are cast. Extra large filler and cap.

CLUTCH—Multiple dry disc type.

CONTROL—Left side drive, center control. Spark and throttle control on dash, leaving steering wheel free of complicated levers. Specially designed foot accelerator.

STEERING GEAR—Ross—screw and nut type 18 in. wheel.

TRANSMISSION—Four speeds forward and one reverse. Selective type.

SPRINGS—Chrome silico manganese steel throughout. Front, 40 in. long, 2½ in. wide; rear, 52 in. long, 3 in. wide. All eyes bronze-bushed.

FRAME—Pressed steel channel section, 6⅛ in. deep; 4 in. width of flange, ¼ in. thick. Reinforced with rigid arched pressed steel across members.

AXLES—Front, drop-forged I-beam section. Rear, worm gear Sheldon semi-floating axle, equipped with ball bearings throughout. 7⅞ to 1 standard reduction.

BRAKES—Foot brake, internal expanding, 18 in. in diameter. Emergency brake, 18 in. diameter. All brakes inclosed.

WHEELS—Schwarz artillery type with interlocking spokes. Front, 12 spokes, 2 in. wide; rear, 14 spokes, 2½ in. wide.

TIRES—Solid. Front 36 x 4 in.; rear, 36 x 7 in. single or 36 x 4 in. dual.

WHEEL BASE—Standard 150 in.; length of frame back of seat, 142 in. Special wheel base, 170 in.; length of frame back of seat, 164 in.

TREAD—Front, 56 in.; rear, 58 in.

GAS TANK—Heavy welded steel, 20-gallon capacity.

EQUIPMENT—Heavy channel steel bumper. Jack and set of tools, tool box, driver's seat, two front side lamps and one rear lamp.

WEIGHT—5550 lbs.

TRAYLOR Trucks are made in 1, 1½, 2½ and 3½ ton capacities

The truck that HAD to make good!

In a concern whose history for twenty years in the engineering and manufacturing field is made up of one continuous series of successes in everything it has attempted from the production of high-grade crushing, milling and mining machinery to the making of shells and the building of ships, there's an undeniable obligation to CONTINUE to make good.

That's why the TRAYLOR Truck is making good NOW.

TRAYLOR Trucks are made in 1-1½, 2½ and 3½-ton capacities.

It is also an excellent reason why dealers should write at once for propositions on those exclusive territories that are still open.

Traylor Engineering & Manufacturing Company

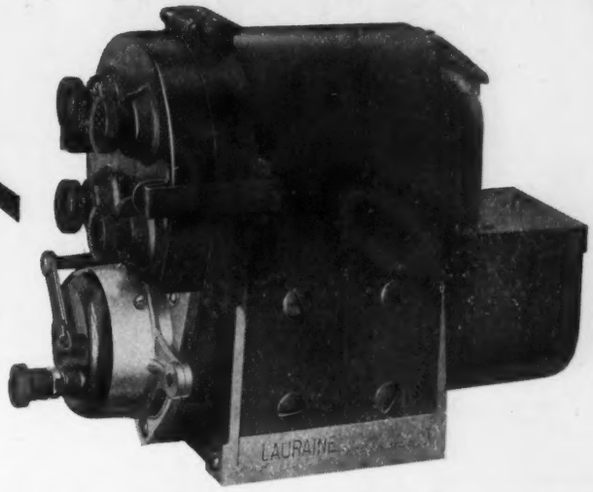
Truck and Tractor Division, Cornwells, Penna.

See our exhibit at the
Boston Auto Show
Space 830—Armory Annex

Eliminate Chance With

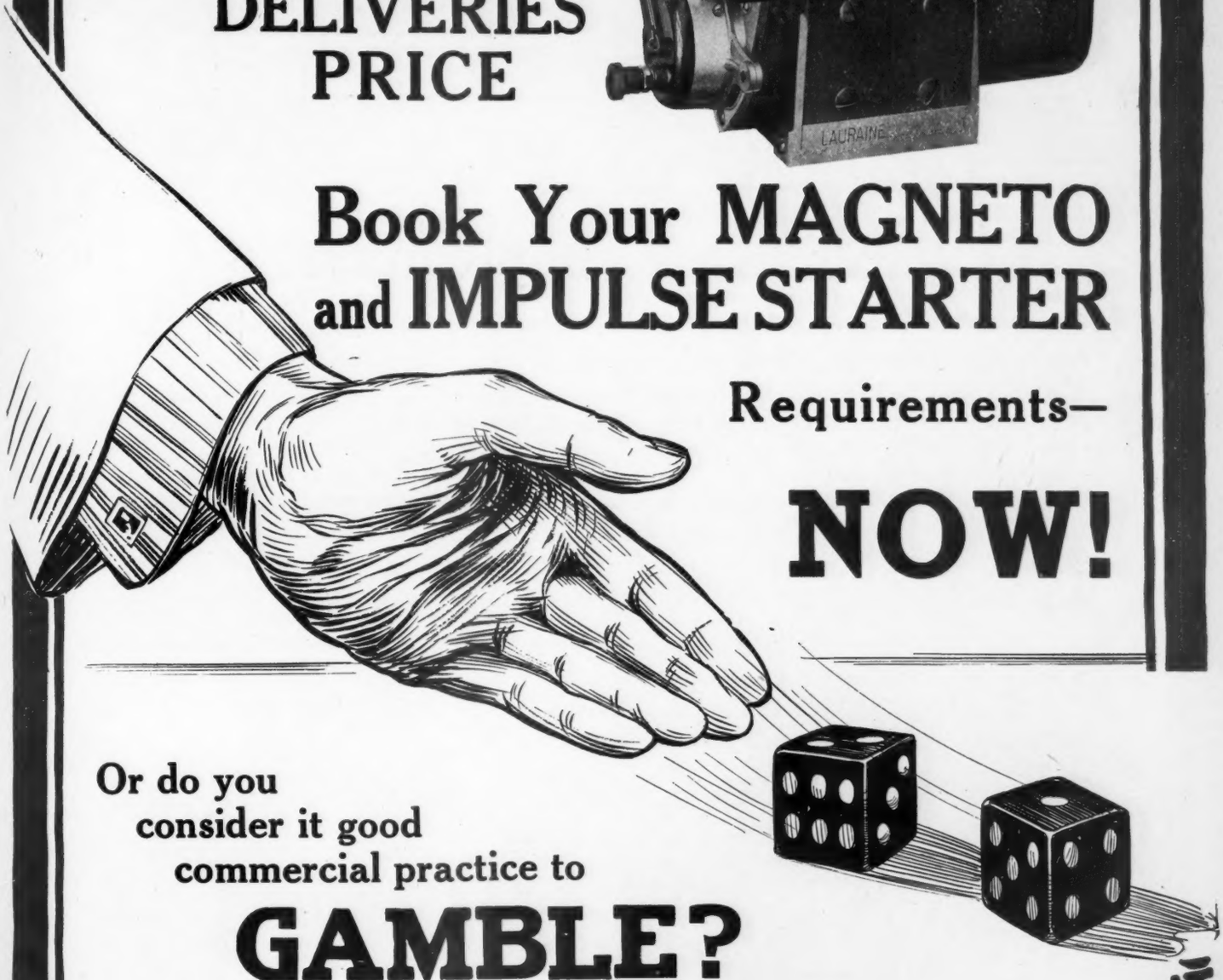
Lauraine
MAGNETO
MADE IN U. S. A.
SANS PEUR SANS REPROCHE

IGNITION DELIVERIES PRICE



Book Your MAGNETO and IMPULSE STARTER Requirements—

NOW!



Or do you consider it good commercial practice to

GAMBLE?

Put Your Faith in Certainties

Namely, the

Lauraine Magneto Company, Inc.

181 to 191 13th Street, Long Island City, N. Y.

ARMLEDER

MOTOR TRUCKS

Watch How They Multiply

One of the main reasons why Armleder Motor Trucks multiply so rapidly in a new territory is due to their ridiculously low repair costs. With their economical upkeep, slight wear on tires, and low repair costs, we have an argument that interests every wideawake motor truck dealer.

A Cincinnati concern writes us that after a year of continuous operation, their Armleder truck incurred a total repair expense of only $74.83. Think of that! A repair average per month of slightly over $6.00. And this is but a single instance from scores of similar cases on record.

Satisfied owners talk about records of this kind. They boost Armleders whenever a chance permits, and automatically the sale of Armleder Trucks becomes an established condition in a territory, caused by the enthusiasm and praise of Armleder users.

The O. Armleder Company **Cincinnati, Ohio**



ARMLEDER

MOTOR TRUCKS

A-M-T

The Best Sales Proposition for Dealers

These advantages, and the elimination of the bugbear of free service, make the Armleder an unequalled sales proposition for dealers.

Every trouble which the average motor truck develops is anticipated and counteracted by the special features of Armleder construction. The frame is flexible, but will not shear out of square. The brakes will not drag or slip; the radiator seldom needs attention; and a center bearing prevents the propeller shaft from getting out of alignment. Exclusive patented Armleder features make selling arguments competitors cannot equal.

There are many rich territories open for Armleder representation. If your territory has not been closed, write us for the Armleder proposition to dealers. We will place facts and figures before you which will leave no doubt as to Armleder superiority.



The springs are one of the patented features in Armleder Motor Trucks. There are no shackles nor bolts; 48 wearing parts eliminated; made of triple heat-treated Vanadium steel, replaced free if they break; shorten 16 to 20 inches under load; reduce gasoline consumption; make tires last longer; without load, weight rests on trip end of spring; with load, weight rests 8 to 10 inches farther down from the end of the spring; they ride easier than a touring car.

The O. Armleder Company — **Cincinnati, Ohio**

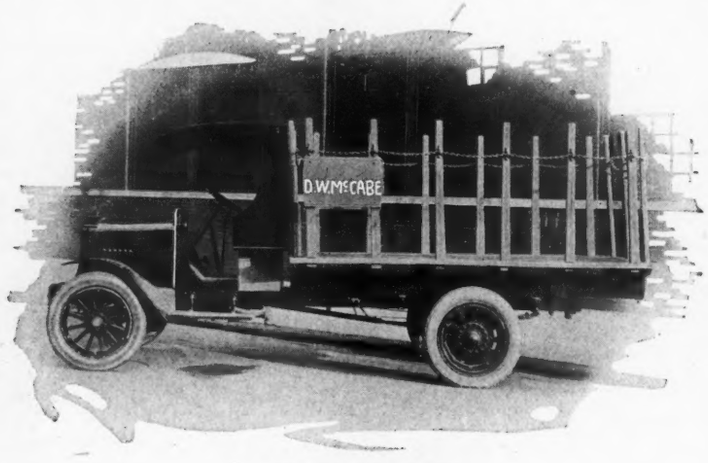
1, 2½ and 3½ Ton Models



THE KEYSTONE

The Popular Priced Truck *of America*

One-Ton and Two-Ton Models



TWO-TON MODEL

Specifications of KEYSTONE 2 Ton Truck Chassis:

RATED LOAD CAPACITY—4000 pounds. Permissible weight on chassis, 5200 pounds, including body load and special equipment.
MOTOR SPECIFICATIONS—Buda 4 cylinder, L-head cylinders, cast en bloc; bore, 3¾"; stroke, 5½"; horsepower, 30; three-point suspension.
GOVERNOR—Pierce, limiting speed to 17.1 miles per hour. 1350 r.p.m.
COOLING — Thermo-Syphon system and belt-driven fan.
RADIATOR—Cast tank, tubular core, easily detachable.
IGNITION — Berling, waterproof, high-tension magneto.
LUBRICATION—Combination positive feed and splash.
CARBURETOR AND FUEL SUPPLY—Zenith automatic with set adjustments, hot-air intake, tank under seat.
CLUTCH — Fuller multiple-disc dry-plate type.
TRANSMISSION—Fuller selective sliding gear type, three speeds forward and one reverse. In unit with motor and clutch.
DRIVE—Spicer; shaft is in two sections with three universal joints, supported in center on self-aligning bearings.
FRONT AXLE—Drop-forged, I-beam section 2½" deep by 2" wide. Web ¼" thick Timken bearings.
REAR AXLE—Russel Internal Gear with heavy load-carrying dead axle of nickel steel.
BRAKES—Service brake, external contracting, operated by foot pedal. Hand brake, internal expanding. Both brakes lined with Raybestos, and acting on 16½ inch drums on rear wheels.
SPRINGS—Semi-elliptic front and rear. Front, 40 x 2½ inches wide, 8 leaves. Rear, 52 x 3 inches wide, 12 leaves. Spring eyes fitted with self-lubricating bushings.
TIRES—Front, 34 x 4 solid or 35 x 5 pneumatic. Rear, 36 x 6 solid or 38 x 7 pneumatic.
TREAD—Front. 56 inches. Rear, 60 inches.
WHEELBASE—144 inches.
EQUIPMENT—Front fenders, two oil lamps set flush in dash, one oil lamp in rear, whistle and set of tools, power tire pump driven from transmission, impulse starter.

PRICE

Two-Ton Chassis
With Solid Tire Equipment
$2100

With Pneumatic Tire Equipment
$2350

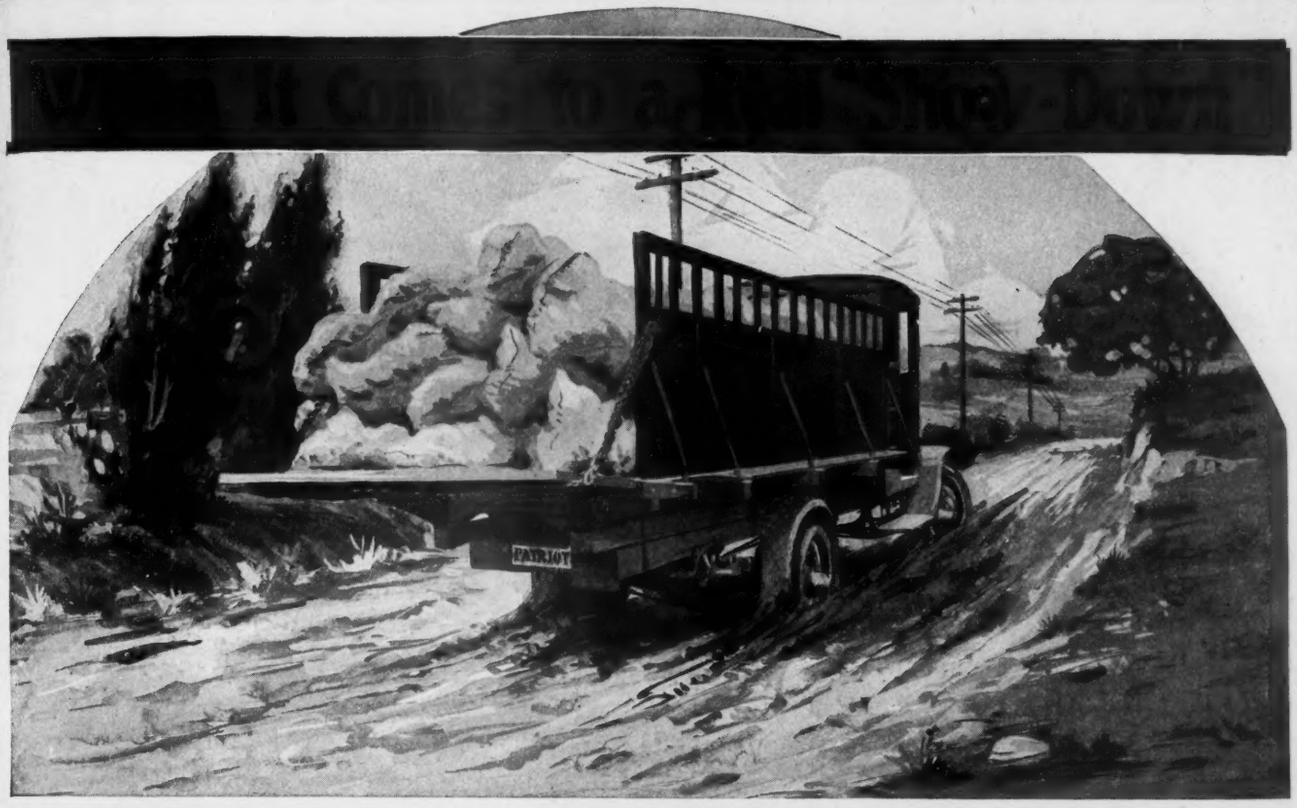
F.O.B. FACTORY

DEALERS: Write or Wire for Territory

KEYSTONE MOTOR TRUCK CORPORATION

Factory Sales Office: 42nd and Chestnut Sts.

Factory: Oaks, Pa. **Philadelphia, Pa.**



PATRIOT

Motor Trucks "Go Through"

On paved highways, no truck gives more satisfactory and economical service than the Patriot.

But if you want to see this unusual truck really perform—get right down and pull—send it charging through hub-deep mud, up slippery hills, through clogging sand, over newly-plowed ground.

You will be astonished at the willing ease with which the Patriot answers unreasonable demands.

Patriot trucks were designed to stand up and deliver under the unusually difficult conditions. We expect the owner to use his Patriot every working day of the year, fine weather or foul, good roads or bad.

Patriots are easy to run and keep running. Few adjustments are necessary, little attention required.

Ask us to send you the new Patriot Catalog

HEBB MOTORS COMPANY, Manufacturers

1331 P Street, Lincoln, Neb.

Revere Model
1500 to 2500 lbs. Capacity

Lincoln Model
3000 to 5000 lbs. Capacity

Washington Model
5000 to 7500 lbs. Capacity



The EISEMANN Supremacy

Dominated the

The majority of all exhibited at the were Eisemann

Eisemann ex- 36% all other

What Does



Eisemann Super-Construction

Extreme Rigidity—Absolutely proof against water and dust.

Magnets permanently retain their power.

Armature and Condenser practically trouble-proof.

Contact-Breaker is simple, sturdy and compact.

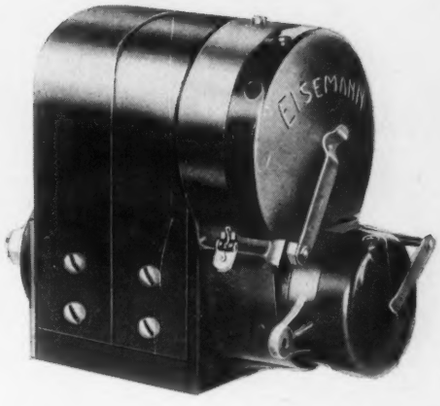
Fewest possible parts consistent with efficiency.

Easy accessibility.

Impulse Starter Coupling insures easy starting.

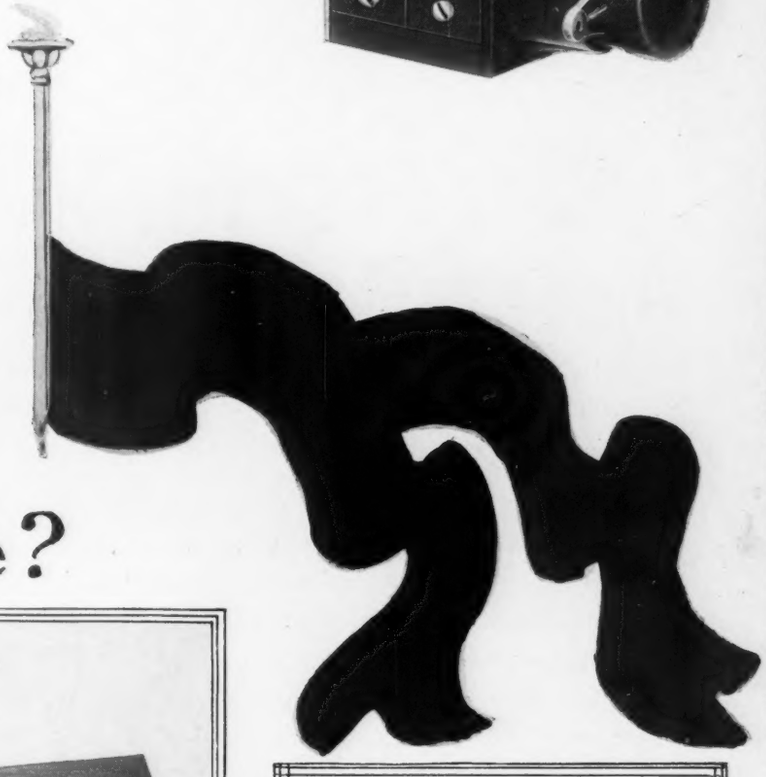
Automatic Spark Advance insures proper timing and prevents back kicks.

MAGNETO

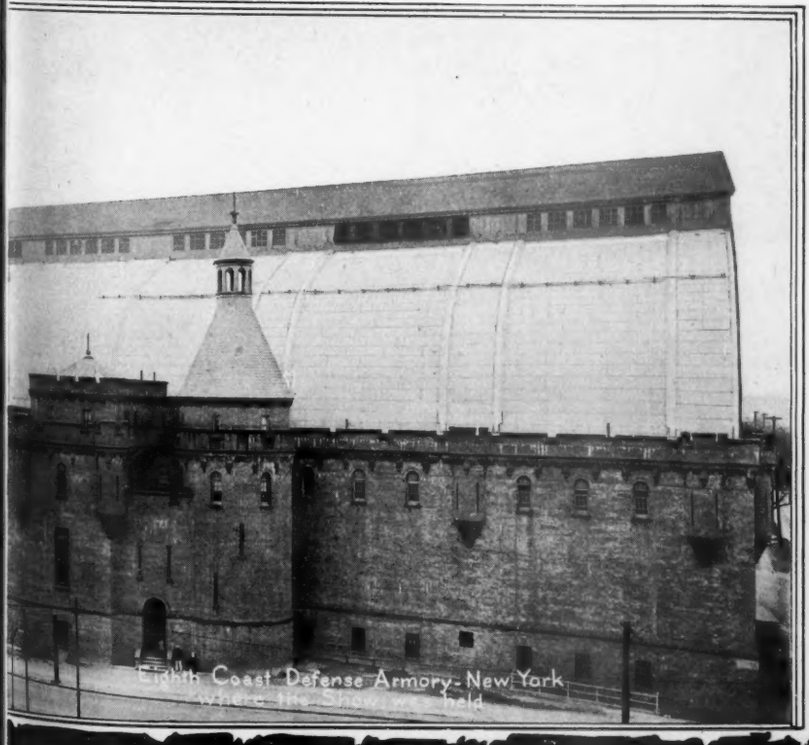


New York Show

makes of Trucks
New York Show
equipped ———.
ceeded by almost
makes combined



This Indicate?



THE EISEMANN MAGNETO CORPORATION

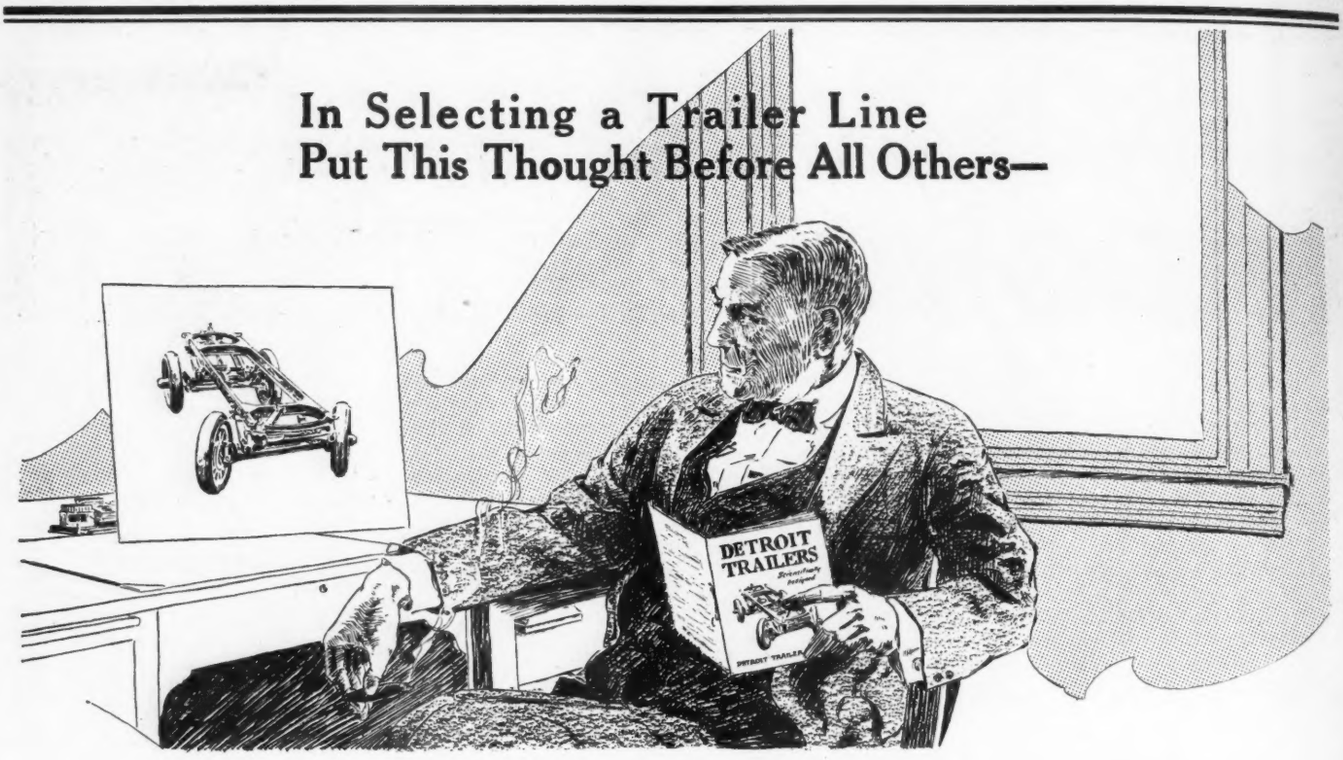
Plant and General Offices
32 Thirty-third St., Brooklyn, N. Y.

CHICAGO—1469 S. Michigan Ave.

DETROIT—85 Willis Ave., West

LONDON, ENGLAND
Stanley J. Watson, 37 Sheen Road, Richmond

In Selecting a Trailer Line Put This Thought Before All Others—



LET QUALITY, NOT PRICE, DECIDE

You'll be glad after you have made your decision to sell a really worth-while Trailer that commands a proper price, and not a cheap affair that cannot hold up under constant service.

In their construction, Detroit Trailers embody the most advanced engineering principles. The automatic locking device that locks the wheels parallel to the frame releases the pole so that it operates on the swivel point and makes it possible to place a Detroit Trailer in almost any position with complete ease.

The drawbar is so pivoted on the frame that the pulling stress is transmitted through the frame and radius rods to the axles with the impulse equally distributed to all four wheels.

These constructional features and many others have placed Detroit Trailers above the ordinary rank of trailers. For these reasons we recommend the Detroit Trailer dealership to your attention.

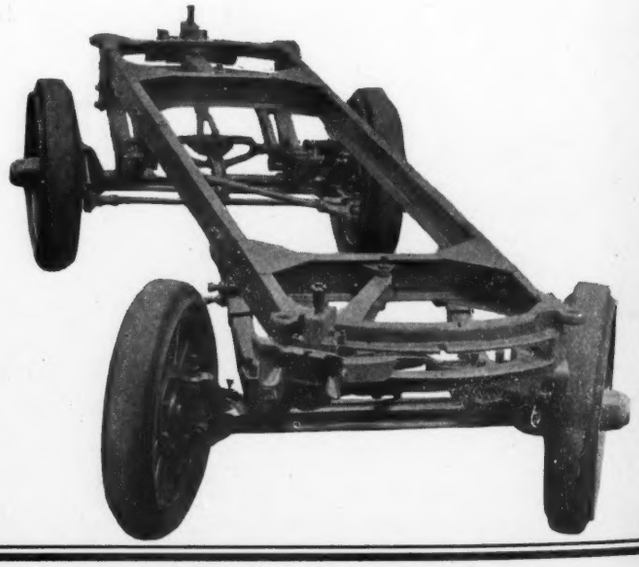
Complete line includes 1½, 3, 5 and 7 ton models.

Detroit Trailer Co., Inc.

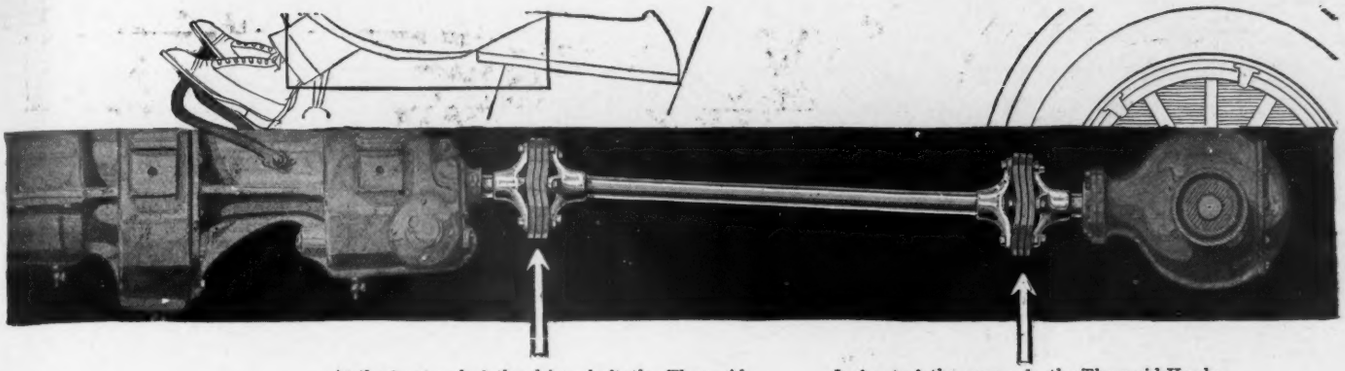
27-37 Jos. Campau Ave. at Atwater St.

Detroit, Michigan
U. S. A.

Canadian Branch: Detroit Trailer Co. of Canada
Walkerville, Ontario



DETROIT TRAILERS



At the front end of the drive shaft the Thermoid-Hardy Universal Joint cushions the blows from the engine, and from every irregularity in the road.

In front of the rear axle the Thermoid-Hardy Joint saves severe wear and tear on the bearings and differential.

Two places where flexible fabric joints are replacing metal universals

AT both ends of the drive shaft are the points where universal joints are in general use in every car or truck.

At both of these points of hard service, the flexible fabric joint has proved its superiority to the metal joint. At both points manufacturers are replacing metal joints with the Thermoid-Hardy Universal Joint.

The places where Thermoid-Hardy Joints have made good

At both ends of the drive shaft Thermoid-Hardy Universal Joints save wear and tear on the transmission and the whole rear axle assembly, by cushioning the blows from the engine, or from the irregularities of the road. Thermoid-Hardy Universal Joints are constructed of flexible fabric discs, which act as cushions in the drive shaft.

Having no metal-to-metal wearing surfaces, the Thermoid - Hardy Joint needs no lubrication. It cannot wear loose.



On many passenger cars, as well as heavy-duty trucks, it has run 60,000 miles without replacement, or adjustment of any kind. Over fifty manufacturers have adopted the Thermoid-Hardy Joint as standard equipment.

Enormous strength of the flexible fabric joint

The patented fanwise construction of the flexible fabric discs gives the Thermoid - Hardy Universal Joint its extraordinary strength. This unique construction, shown below, is the only way in which uniform strength and elasticity can be obtained.

Your customers will be quick to appreciate the advantages of the Thermoid-Hardy Joint on their trucks.

Send for advance proofs of the national advertising campaign, and our new book, "Universal Joints—Their Use and Misuse." The book will give you in detail the construction of the Thermoid-Hardy Joint, records of performance, opinions of leading engineers and manufacturers who have adopted it.

Thermoid Rubber Company

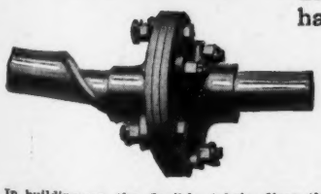
Sole American Manufacturers

Factory and Offices: TRENTON, N. J.

New York Chicago San Francisco Detroit Cleveland Atlanta Philadelphia Pittsburgh Boston London Paris Turin

LIST OF USERS

American-British Mfg. Co.
Allis-Chalmers Mfg. Co.
Anderson Motor Co.
The Autocar Co.
Available Truck Co.
Barley Motor Car Co. (Roamer)
Briscoe Motor Corp.
Crow-Elkhart Motor Co.
Jas. Cunningham Son & Co.
Dart Truck & Tractor Corp.
The Dauch Mfg. Co.
Diamond T Motor Car Co.
Dixie Motor Car Co.
Doane Motor Truck Co.
Fageol Motor Car Co.
H. H. Franklin Mfg. Co.
Garford Motor Truck Co.
Gramm-Bernstein Motor Truck Co.
Hebb Motors Co.
Hendrickson Motor Truck Co.
Holt Mfg. Co.
International Harvester Co. of A., Inc.
International Motor Co.
Kentucky Wagon Mfg. Co., Inc.
King Motor Car Co.
King Zeitler Co.
Larrabee-Deyo Motor Truck Co., Inc.
Lexington Motor Co.
Locomobile Co. of America
Maxwell Motor Corp.
Menominee Motor Truck Co.
Mercer Motors Co.
Moreland Motor Truck Co.
McFarlan Motor Co.
Nelson & LeMoon
D. A. Newcomer Co.
E. A. Nelson Motor Car Co.
Nelson Motor Truck Co.
O'Connell Motor Truck Co.
Oliver Tractor Co.
Oneida Motor Truck Co.
Packard Motor Car Co.
Parker Motor Truck Co.
Pierce-Arrow Motor Car Co.
Reo Motor Car Co.
Root & Vandevoort Engineering Co.
Sanford Motor Truck Co.
Service Motor Truck Co.
Stoughton Wagon Co.
Studebaker Corp.
Stutes Mar Tractor Co.
Templar Motors Corp.
Tioga Steel & Iron Co.
Tow Motor Co.
Traffic Motor Truck Corp.
Transport Truck Co.
Twin City FourWheel Drive Co., Inc.
Walter Motor Truck Co.
Ward-LaFrance Truck Co., Inc.
Watson Products Corp.
Wichita Motors Co.
H. E. Wilcox Motor Co.
J. C. Wilson Co.
Willys-Overland, Inc.
Zeitler & LamsonTruck & Tractor Co.



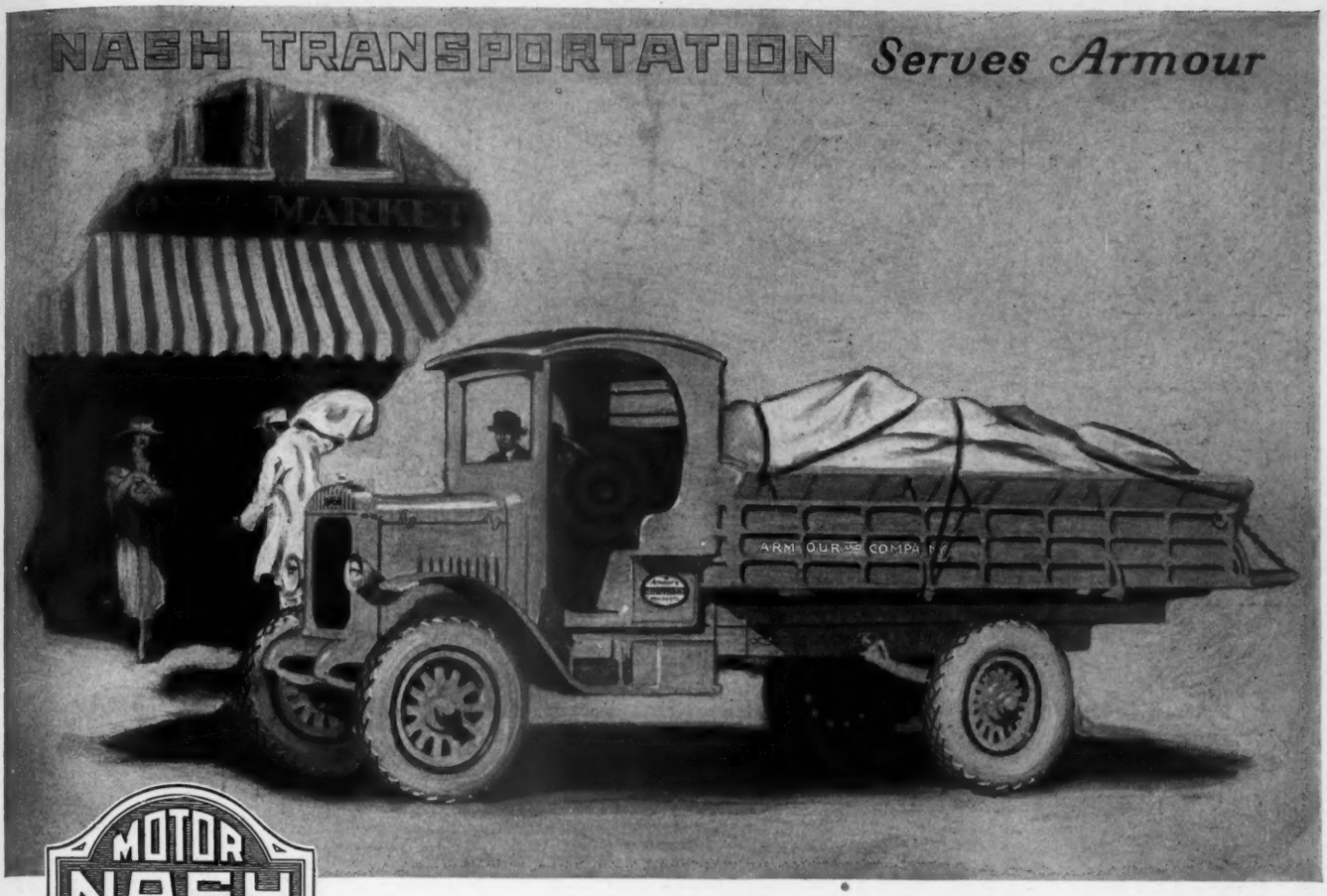
In building up the flexible fabric discs, the several layers of fabric are put together so that the strands in each piece run in a different direction. This patented fanwise construction provides the greatest tensile strength. In a laboratory test made recently at Purdue University the drive shaft, itself, was twisted at a total stress of 21,700 inch pounds without injury to the universal joint.

THERMOID-HARDY UNIVERSAL JOINT

Fanwise construction for strength

Makers of "Thermoid Hydraulic Compressed Brake Lining" and "Thermoid Crolide Compound Tires"


THE SATURDAY EVENING POST
83
Locomotive Axle Principle
Serves Best on Rails and Roads
THE wheels on locomotives and on Sheldon Worm Gear Axles for motor trucks are fixed to a live load-carrying axle. The bearings are widely separated.
Supreme axle strength, leverage and rigidity are obtained by this principle in axle construction.
Remember when you buy a motor truck that, just as in a locomotive, the axle is the vital factor in determining its strength. It must be the best in principle if you want the best and most economical in service. Every truck owner appreciates the value of low maintenance costs and no time lost for repairs.
Trucks equipped with Sheldon Worm Gear Axles carry their loads and stand racking side-strains because the axle is based on the engineering principle that carries the Freight Tonnage of the World.
There is a Sheldon-equipped truck for every size from ½ ton to 5 ton capacity, and for every purpose.
TRADE MARK
Write for booklet on Sheldon Superiorities
SHELDON AXLE & SPRING COMPANY, Wilkes-Barre, Pa.
Manufacturers of Sheldon Axles for Motor Trucks and Sheldon Springs for Trucks and Automobiles
Sheldon Axle
FOR MOTOR TRUCKS
CONSTRUCTED ON THE LOCOMOTIVE AXLE PRIN



MOTOR NASH TRUCKS

AFTER giving the Nash a thorough tryout in its service, Armour and Company evidenced its opinion of this truck recently when it added further to its Nash equipment.

Nash Trucks Serve Their Owners Well

NASH trucks provide their owners a dependable hauling service over a period of years.

Delays on the road are practically eliminated by the automatic locking differential with which all Nash trucks are equipped. This prevents spinning of either driving wheel alone. As long as either driving wheel has traction the Nash truck gets out of difficulty under its own power.

The strong and scientific construction of Nash trucks in the big Nash factory at Kenosha keeps at a minimum the time off duty for adjustments and overhauling and is also the reason for their long and satisfactory life in use.

Nash Trucks—One-Ton Chassis, Two-Ton Chassis, Nash Quad Chassis

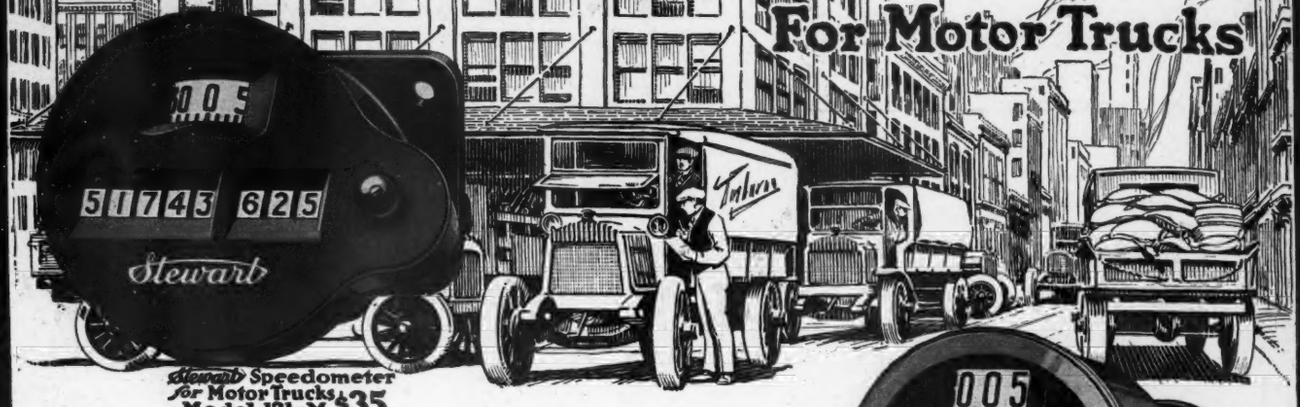
The Nash Motors Company, Kenosha, Wisconsin
Manufacturers of
Passenger Cars and Trucks, Including the Famous Nash Quad

Nash Motor Sales Limited, Toronto, Ont., Distributors of Nash Cars and Trucks for the Dominion of Canada

NASH MOTORS

VALUE CARS AT VOLUME PRICES

Stewart Custom Built NECESSITIES For Motor Trucks



Stewart Speedometer for Motor Trucks Model 131-M $35



Cost per Mile is the Vital Problem!

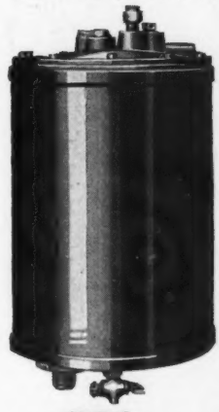
WITHOUT a Stewart Truck Speedometer you are in the dark. With it, ***you know.*** To be operated with greatest efficiency and economy, every truck ***must*** have a Stewart Speedometer. Tells you the mileage you get from gas, oil and tires. Tells you how much territory your truck covers daily. Pays for itself by reducing expenses.

The Stewart Vacuum System is the only thoroughly satisfactory, absolutely trouble-proof gasoline feed for trucks ever devised. A Stewart Warning Signal to clear the road, and Stewart Searchlights to prevent accidents after dark, are other safety-first necessities that no truck can afford to be without.

Truck dealers find the Stewart line most profitable to handle
Write for proposition

Stewart-Warner Speedometer Corporation
Chicago, U. S. A.

Stewart Speedometer for Motor Trucks Model 131-Y $25

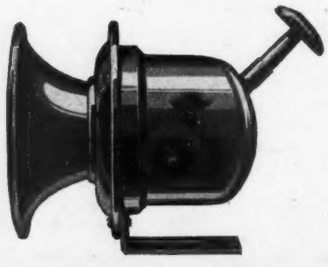


Stewart Heavy Duty Vacuum System $18



Stewart Searchlight Model 139-C $7.50 Mirror on back

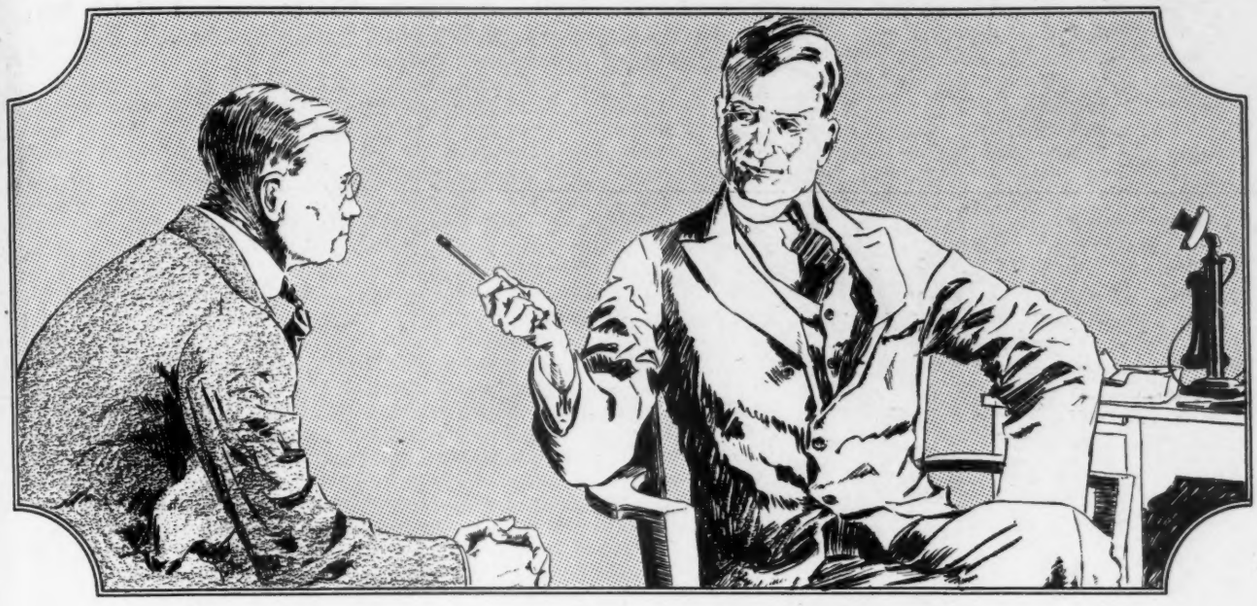
Stewart Hand Operated Warning Signal Model 151-A $3.75





Stewart Hand Operated Warning Signal Model 115 $4.75

"No Motor Truck Complete Without Them"



Go After the Truck and Trailer Business in Your Locality With the Columbia Truck and Trailer Line

All around you there are hundreds of ripe selling opportunities. You merely need the right products to sell. The Columbia 2 ton truck is logical capacity for the greatest number of businesses. It sells at a most reasonable price because our overhead of production is low. With the Columbia Trailer line you can give your customers any kind of a Truck and Trailer combination that may suit their varied needs. A truck can haul at least four times as much as it can carry. The Columbia 2 ton truck and 6 ton trailer is the ideal combination, doing in half the time the work of a 5 ton truck at the upkeep expense of a 2 ton truck.



Built to Back a Real Guarantee

We will give the Columbia Selling Rights to a few more dealers. Your territory may be open. Write.

Columbia
MOTOR TRUCKS AND TRAILERS

The Columbia Motor Truck & Trailer Company
PONTIAC, MICHIGAN



The Bethlehem Delivery Boy

Speed, Endurance and Economy—these three qualities reach their highest development in this newest Bethlehem Motor Truck. The Bethlehem Delivery Boy completes a line of trucks which enables a dealer to cover his field with greatest profit. Is your territory open?

¾ Ton Chassis
1½ Ton Chassis
2½ Ton Chassis
3½ Ton Chassis

Bethlehem Motors Corporation
Allentown **Pennsylvania**



"How" *and* "Why"

EXAMINE the VanBriggle cross-sections above and you will understand the "how" and the "why" of the Van Briggle Airplane Principle Carburetor —its performance, dependability and economy.

The incoming air (see illustration AA) strikes directly upon the lip of the nozzle on the inlet side. It automatically controls the flow of gasoline—and instantly corrects the proportion of air and gasoline, thus obtaining the most power, with economy, at all speeds and under all conditions.

VAN BRIGGLE CARBURETORS

When motor is not running (illustration A), the gasoline level in the bowl is always above the top of the nozzle. This permits the mixing chamber to fill up to the same level —forming a puddle of reserve "pep", which acts as a primer in starting. When running, the high float-level in the bowl gives instant acceleration—a vital element of safety and satisfaction in traffic. ¶ Equip your Ford, Maxwell or Dodge car or truck with a Van Briggle Airplane Principle Carburetor. Complete, with strainer, ready to install, at prices quoted. Your dealer or garage man will supply you. Ask him today.

FORD	$ 7.50
MAXWELL	12.00
DODGE	15.00

VAN BRIGGLE SHOCK ABSORBERS *for* FORD TRUCKS *and* CARS



1920 Model

Van Briggle Shock Absorbers for Ford one-ton trucks will be ready for delivery in April. Simple, durable and wonderfully effective. Installed without removing wheels or changing anything. ¶ Van Briggle Shock Absorbers for lighter Ford cars remain the same in principle. But, by a simplifying step, the operation has been improved. Installed without removing wheels or changing anything. Your dealer or garage man can supply you. See him today.

Car and Truck Owners: Write for interesting free booklet, "Successful Carburetion."

Jobbers and Dealers: Write for sales proposition.

VANBRIGGLE MOTOR DEVICE CO., INDIANAPOLIS, U.S.A.

BOSCH



The Years Behind Bosch

THROUGH nearly half a century of dependable performance Bosch Magnetos have established an unparalleled service record among three million owners.

And through all these prestige-building years has grown the Bosch Service organization—a wonderfully efficient, nation-wide, world-wide chain of Bosch Service Stations.

AMERICA'S SUPREME
MOTOR TRUCKS - TRACTORS - AIRPLANES - MOTOR CARS

Magneto



Bosch Service—Bosch Prestige, backed by an enormous national advertising campaign, and the closest kind of sales co-operation with dealers, is making prospective purchasers of the truck you sell, if you can say, "With Bosch High-Tension Magneto Ignition."

Your trucks can come through from the factory Bosch equipt if you insist on getting it.

Be Satisfied
Specify Bosch

AMERICAN BOSCH MAGNETO CORPORATION
Main Office and Works: Springfield, Mass.
Branches: New York, Chicago, Detroit, San Francisco
300 Service Stations in 300 Centers

IGNITION SYSTEM
MOTOR BOATS - MOTORCYCLES - GAS ENGINES - ETC.

Whence comes this extra power?

First—From the proper conception of the daily duty demanded of a truck or tractor engine.

Second—From a design thoughtful of all contingencies of the days work.

Third—Through the workmanlike execution of this thoughtful design in a highly specialized engine plant.

————The absence of vibration, the insurance against whipping and dis-alignment of the crankshaft, the ample bearing surfaces and positive lubrication, all combine to transmit *all* the power generated into actual driving force.

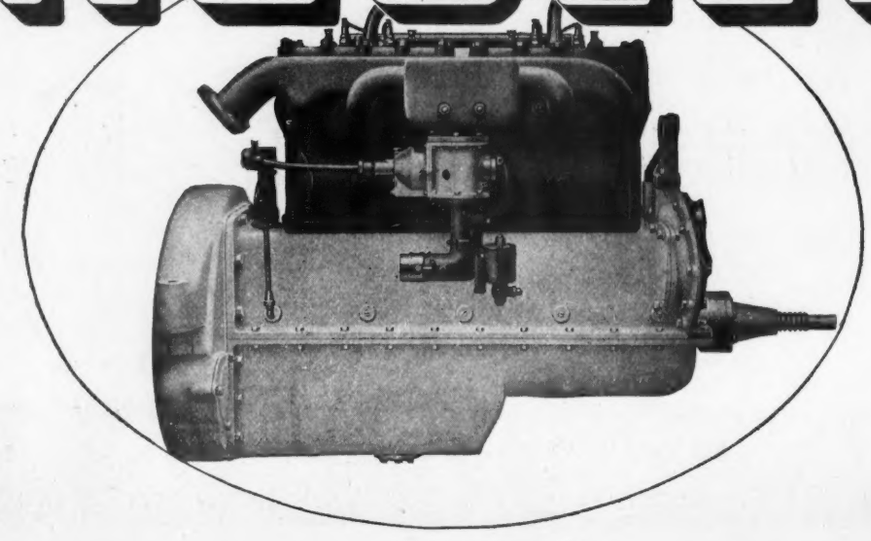
The Hercules Motor Mfg. Company
CANTON OHIO

Sales Offices:

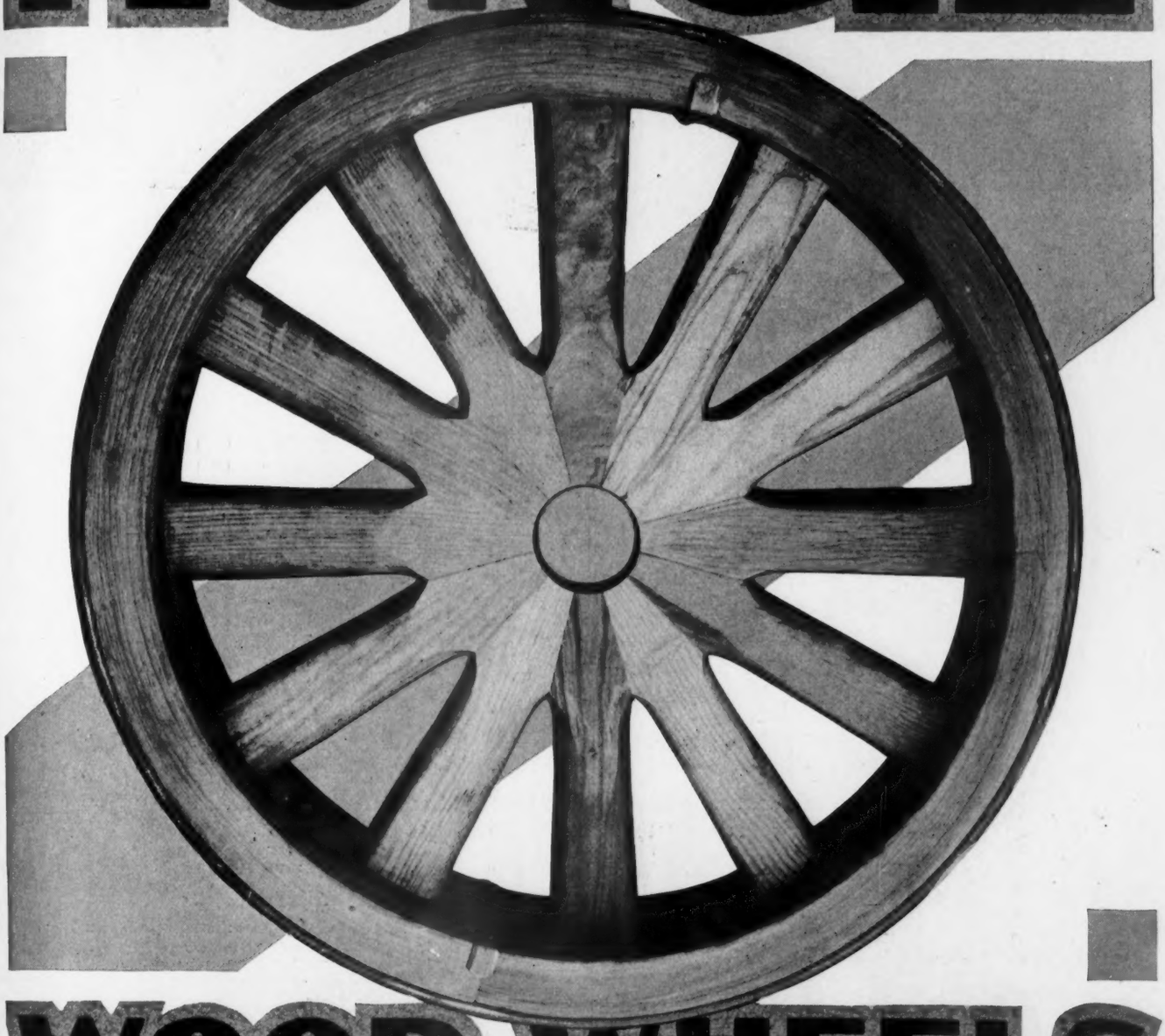
Detroit Chicago Buffalo San Francisco London, England

HERCULES

For Trucks and Tractors



MUNCIE



WOOD WHEELS

Are made by men of experience and integrity; men who are doing their part and giving an honest day's labor for an honest day's pay.
They are made of either Hickory or White Oak.
With proper care, they will outwear all other parts of the truck.
Send us your Blueprints and get our prices before buying.

Buy Wheels Made by Bannister if You Want the Best

Muncie Wheel Company, Muncie, Indiana



Selling the idea

through Brake Lining

IN your capacity as technical adviser to the motorist, you have an opportunity to profit by the economy idea.

Take brake lining, for instance—you know one big feature of Johns-Manville Non Burn Asbestos Brake Lining is economy.

Economy because Johns-Manville Non Burn is made of Johns-Manville Asbestos—the only material that is fit to stand the terrific heat and grinding wear of braking service.

Economy—not only in purchase price, but for the longest service per dollar that any lining can give under any conditions.

Play up this economy idea—it's a fact—backed by Non Burn—the worthy representative of Johns-Manville Asbestos in the Automotive Field.

And as to profit—ask your jobber to show you what others, who handle Johns-Manville Non Burn, are doing right now.

JOHNS MANVILLE SERVICE
COVERS THE CONTINENT

Through—

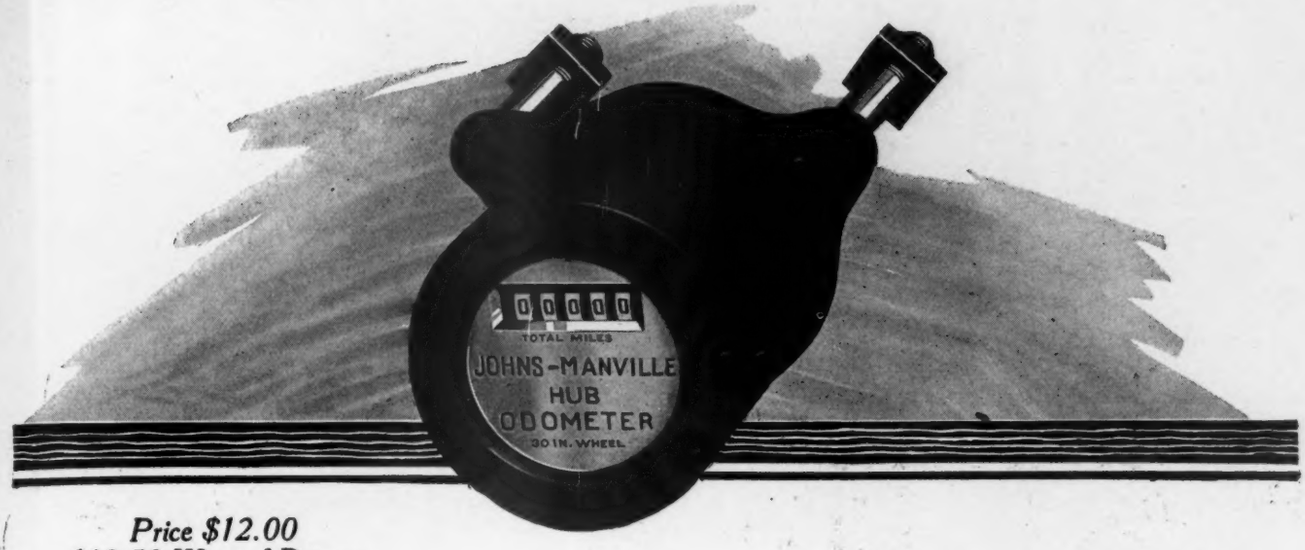
Asbestos

and its allied products

JOHNS-MANVILLE
Serves in Conservation

Heat Insulations, High Temperature Cements, Asbestos Roofings, Packings, Brake Linings, Fire Prevention Products

JOHNS—
AUTOMOTIVE



Price $12.00
$12.50 West of Denver

of economy

and Hubodometers

NO matter how good a guesser a truck owner is, he can't tell how many miles he gets for a dollar unless he has a mileage recorder.

Tell him so. Show him why he needs a Johns-Manville Hubodometer on his car to know the distance traveled and keep track of expenses.

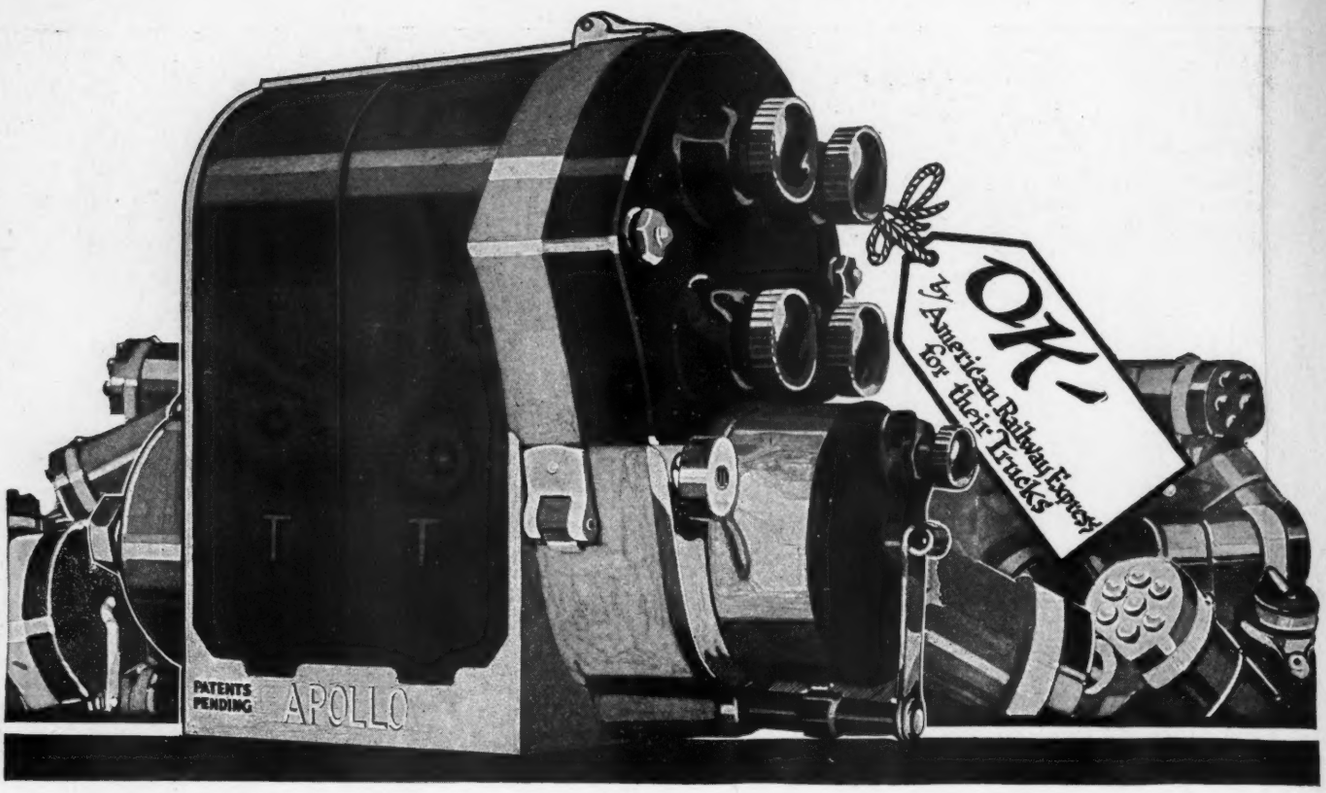
Sell him the economy idea in a Johns-Manville Hubodometer. Go after the Ford owners especially. The Johns-Manville Hubodometer can be quickly attached to the wheel—it's made to fit exactly. Mechanically it's a precision instrument—yet a simple one, without a single unnecessary part.

You certainly can talk economy to the man with a Ford truck—and there's real profit in it for you.

Our Jobber-Dealer Sales Policy assures you real trade protection. Write for details.

H. W. JOHNS-MANVILLE CO., New York City
10 Factories—Branches in 63 Large Cities
For Canada, Canadian Johns-Manville Co., Ltd., Toronto

MANVILLE
EQUIPMENT



300 *Magneto Replacements*

AS a result of tests conducted in all parts of the country, the AMERICAN RAILWAY EXPRESS CO. has already replaced over 300 magnetos of various makes, on their motor trucks, with APOLLO MAGNETOS.

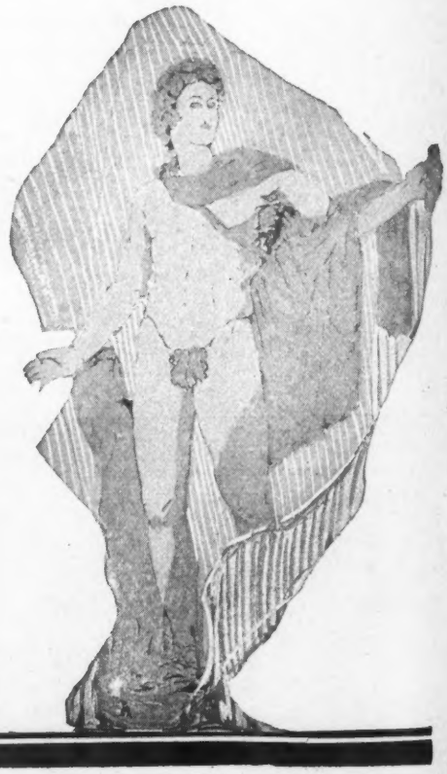
These APOLLO MAGNETOS are making good under the most severe conditions. Their high voltage at low cranking speeds—assuring exceptionally easy starting of the motor on the coldest days—especially appeals to the drivers.

The APOLLO MAGNETO requires no Impulse Starter.

PRICE 2 and 4 Cylinder **$100.00**
(6 Cylinder $125.00)

Let us send you copy of our Catalog fully explaining the many superior features of the APOLLO MAGNETO

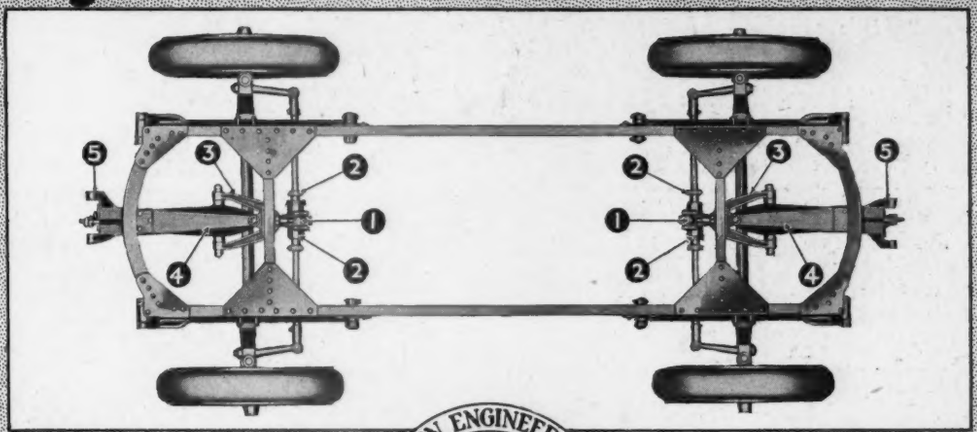
The Magneto of Quality
—Built for the Best



APOLLO Magneto

Apollo Magneto Corporation, 87 Grand Ave, Kingston-N.Y.

Announcing the Byron Trailer



BYRON ENGINEERING WORKS · The Byron Trailer · LOUISVILLE, KENTUCKY

Five Points of Superiority

(Exclusive BYRON Construction)

1 Ball-and-socket joint, keeping steering gear in perfect alignment and preventing swaying when trailer goes over bumps and ruts or when frame is rocked from side to side.

2 Enclosed heavy coiled spring connection between steering gear and axle, absorbing all road shocks and preventing the bending of steering arms when any wheel strikes an obstruction.

3 Swinging steering arm that connects steering parts on axle to steering parts on frame, swinging parallel to action of springs and keeping steering gear in alignment, regardless of spring deflection.

4 Independent steering arm, connecting steering gear to drawhead or to frame, as required, and allowing trailer to be steered by hand independently of drawbar, whether going forward or backward.

5 Drawhead connection, locking drawbar in place automatically without loose parts, so that when trailer is once attached to truck it positively cannot become disconnected by accident.

Consider What This Superiority Means

These exclusive features mean that you can save time, money and labor in operating Byron Trailers. The independent steering arm allows easy manoeuvering to any desired position, forward or back, without uncoupling the trailer. The ball-and-socket swivel and the spring connections absorb all shock and jar caused by striking curbs, ruts or other obstacles, thus preventing wearing strains on the mechanism.

The Byron Trailer is the latest and best creation of one of the most successful pioneers of the trailer industry. It fills the demand for a better trailer, and it is backed by an organization combining supreme engineering ability and absolute financial responsibility. The Byron Trailer is high-grade in every particular. Built in 4-wheel, semi-trailer and pole types.

Byron Trailers offer exceptional opportunities to energetic motor truck dealers under our very liberal agency proposition. Write or wire for complete information

Byron Engineering Works

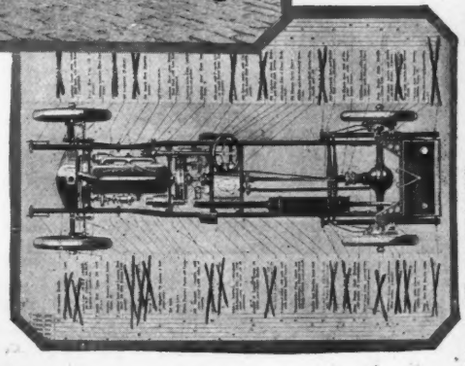
General Offices and Factory: Louisville, Kentucky

All Genuine Graphited Oil-less Bushings have always been made at Bound Brook, U. S. A.









The Real Savings Begin Right at the Drafting Table

WHEN it reaches the drafting table—that new design for a car or truck or tractor chassis—it is no longer a broad principle, but becomes a series of details.

Right here you effect your savings—in the elimination of unnecessary items. You get what your pencil gives; simplicity or complexity, ruggedness or frailty, protection or risk—*the finished job is what the blueprints make it.*

There is provision for lubrication—of important details the most important; 20 or 30 grease cups for the driver or owner to care for. So there must be provision against neglect, if the chassis you make is to serve out its full period of usefulness in another's hands.

And in specifying "Bound Brook" (Graphite and Bronze) or "Nigrum" (Impregnated Wood) Oil-less Bushings for all inaccessible bearing points, you furnish a vitally necessary safeguard, while greatly simplifying the problem of maintenance and reducing grease cup installation. Oil-less Bushings, by virtue of *their construction offer full protection* against sudden wear and breakdown—you will find that they will maintain smooth running efficiency, in spite of neglect, for a longer time than will any other type of bushing.

Make Oil-less Bushings a part of design, and banish risk.

Bound Brook Oil-less Bearing Co.

Specialists in the manufacture of Oil-less Bushings for more than a third of a century

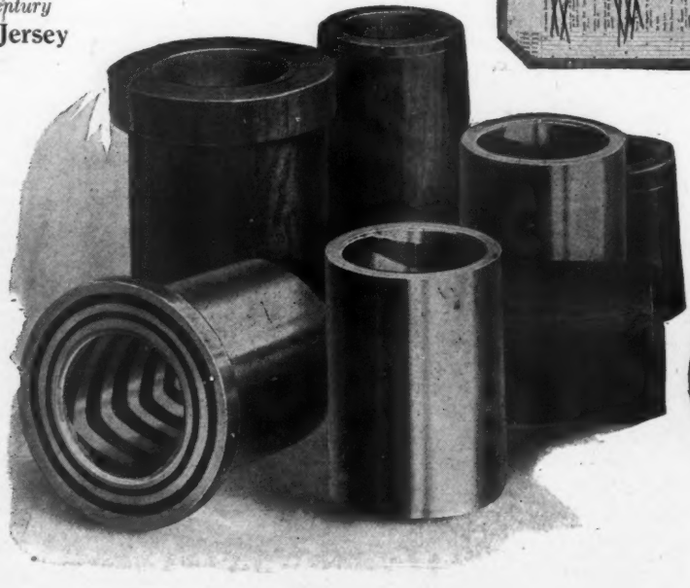
Bound Brook **New Jersey**

Detroit Office
1723 Ford Building

BOUND BROOK AND NIGRUM

Trade-Mark
Reg. U. S. Pat. Off.

OIL-LESS BUSHINGS







"NORMA" PRECISION BALL BEARINGS

(PATENTED)

Practically all high-grade, reliable magnetos and lighting generators are "NORMA" equipped. The reason most owners don't realize it is that their attention is never drawn to a part that so silently, so surely does its duty. The trouble-making parts are the ones that get attention—and condemnation.

See That Your Electrical Apparatus is "NORMA" Equipped

THE NORMA COMPANY OF AMERICA

Anable Avenue
Long Island City
New York



Ball, Roller, Thrust and Combination Bearings

Users Appreciate

ARCHER

STEEL DUMP BODIES AND HAND HOISTS

Because:

The body is built to fit any chassis.

It is cold formed with angle steel at points necessary.

The tailboard swings from top or bottom.

A pull of only 20 pounds on the hoist will dump a 5 ton load in 2½ minutes—one-ton in 30 seconds. No upkeep.

The Archer body can be fitted to the chassis by one man in one hour.



Asbestos Textiles
Cloth Yarn Cord
Carded Fibre Braided Tubing

gripping, and preventing hardening or burning. It is a "whale" of a brake lining!

Garco is safe for the dealer who sells brake linings by the dictates of conscience. And it is profitable, too. Write for dealer proposition.



Garco Transmission Lining for Ford Cars



Garco Gaskette Roll

GENERAL ASBESTOS AND RUBBER CO.

Main Office and Factories
CHARLESTON, S. C.

Branches and Complete Stocks

58 Warren Street, New York
14 North Franklin Street, Chicago
311 Water Street, Pittsburgh

GARCO ASBESTOS BRAKE LINING

DROP FORGINGS

Open Hearth or Alloy Steel Capacity 1,500 Tons Per Month

TYPICAL TRUCK FORGINGS

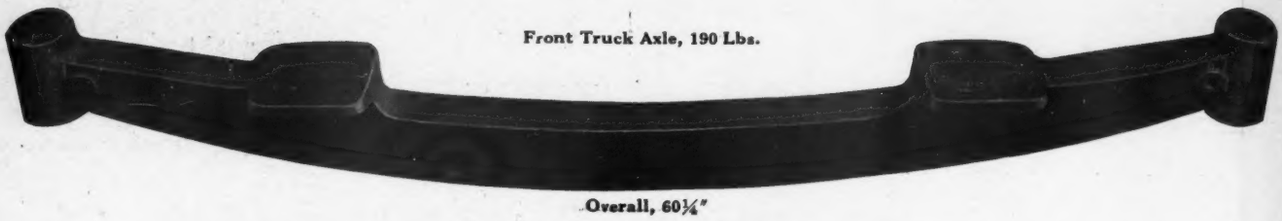
CHANGED MONTHLY

Rear Truck Axle, 295 Lbs.



Overall, 90″

Front Truck Axle, 190 Lbs.



Overall, 60¼″

Heat Treating and Complete Laboratory Equipment

MACHINE FINISHED CRANK SHAFTS

UNION SWITCH & SIGNAL COMPANY

SWISSVALE, PA. (2 Miles East of Pittsburgh)



For Service and Appearance Always Select

A. B. & B. SHEET METAL PARTS

In choosing the sheet metal parts to use on your truck output, take into consideration both quality and style.

As the result of many years of experience this company produces tanks, hoods, fenders, battery boxes, runningboard shields, pans, and all other sheet metal parts of a sound and sturdy construction.

Not only do A. B. & B. sheet metal parts stand the rigors of truck operation successfully—but they retain their original style and appearance. We specialize on hoods, fenders and tanks that are guaranteed in every way, giving the trucks on which they are used, freedom from repairs and loss of working hours.

Send us your blueprints for estimates
Samples of stock furnished with estimates

A.B.&B. Sheet Metal Works

CHAS. STOLPER, President

Fond Du Lac Ave. & 33rd St., Milwaukee, Wis.

A Grease Gun on Every Bearing

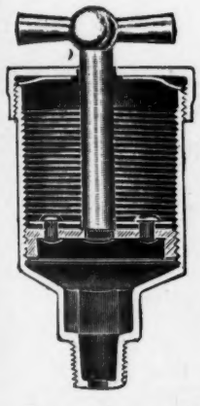
Not one that must be attached every time grease is needed

—but one that remains on the bearing without refilling for 15 to 35 greasings—

depending upon the size used and the part to be lubricated.

EMPRESS Plunger Feed Grease Cup No. 214

does the work of a grease gun or similar device more effectively, readily and easily. Simply fill and attach, giving the handle one-half turn when grease is needed. Seldom necessary to get under the car. The handle is usually within reach, but for cases where it cannot readily be reached extension nipples can be used.



No. 214 Marine Leather Packed Grease Cup



TESTED UP TO 1000 POUNDS PRESSURE WITHOUT LEAKING

Drawn from rolled sheet metal, these cups combine lightness with strength; they are built to withstand the roughest kind of service. Fitted with a locking device, the cap is effectively prevented from jarring loose; it locks at every quarter turn; not affected by vibration. Made from brass and steel, in five sizes and in several finishes. The leather packing on the plunger insures an even pressure at all points and prevents leakage.

WRITE FOR CATALOG F—TODAY

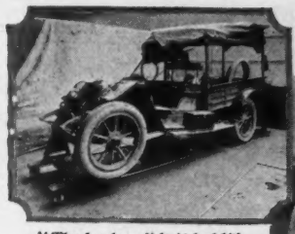
It gives full description of this cup and others

BOWEN PRODUCTS CORP.

AUBURN DIV., AUBURN, N.Y. MINNEAPOLIS DIV., MINNEAPOLIS, MINN.
WINKLEY DIV., DETROIT, MICH. ZERK DIV., CLEVELAND, OHIO
Canadian Factory—CANADIAN WINKLEY CO., LTD., WINDSOR, ONT.

SALES OFFICES:

NEW YORK, 220 BROADWAY CHICAGO 1607 OTIS BLDG.
BOSTON, 253 FRANKLIN ST. CINCINNATI, 409 LYRIC BLDG.
SAN FRANCISCO, MONADNOCK BLDG.



"The brakes didn't hold"



There is also a moral responsibility in selling brake lining

"The brakes didn't hold" is a post-accident verdict that is too often associated with inferior brake linings.

Brake lining is one item of automotive equipment which need never be sold on price. For the customer who is led to appreciate the responsibility involved will think only of getting the most dependable brake lining the market affords.

ASBESTOS PRODUCTS

Packings
Locomotive Throttle and Air Pump Packings
High Pressure Piston Packings
Valve Stem Packing
Medium and Low Pressure Packings
Perfect Valve Rings
Flax Packings
High, Low and Medium Pressure Sheet Packings
Gaskets and Gasketing Material
Asbestos Wick and Rope

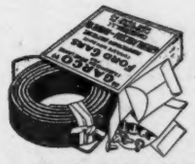
Asbestos Automobile Specialties
Brake Lining
Transmission Lining for Fords
Cone Clutch and Disc Clutch Facings
Asbestos Spark Plug Yarn

Asbestos Textiles
Cloth Yarn Cord
Carded Fibre Braided Tubing

Garco Asbestos Brake Lining is constructed with a full sense of the responsibility resting upon the makers. No effort is spared to make it as reliable and durable as a brake lining can be made.

Garco is woven as tightly, compressed as solidly and wire-reinforced as strongly as human ingenuity has yet made possible. Its asbestos content is selected with the utmost care. It is impregnated with a thoroughly tested friction compound that carries unequalled qualities for gripping, and preventing hardening or burning. It is a "whale" of a brake lining!

Garco is safe for the dealer who sells brake linings by the dictates of conscience. And it is profitable, too. Write for dealer proposition.



Garco Transmission Lining for Ford Cars



Garco Gaskette Roll

GENERAL ASBESTOS AND RUBBER CO.
Main Office and Factories
CHARLESTON, S. C.

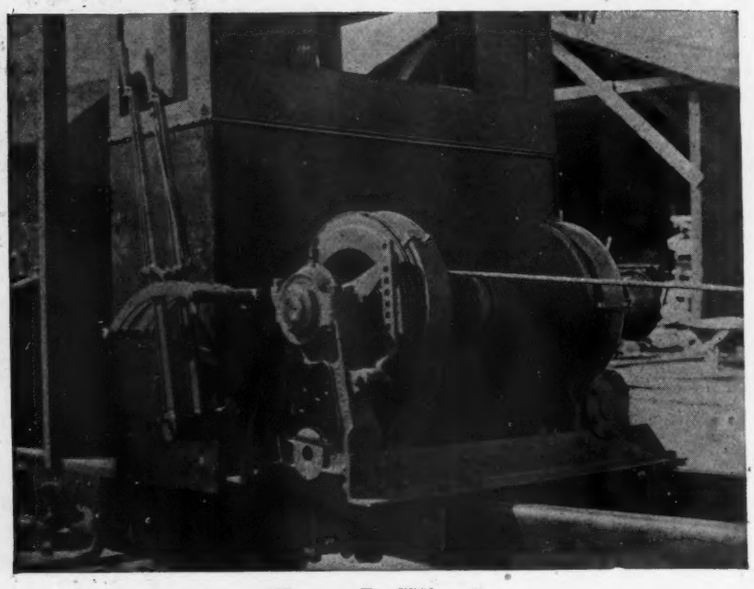
Branches and Complete Stocks

58 Warren Street, New York
14 North Franklin Street, Chicago
311 Water Street, Pittsburgh

GARCO ASBESTOS BRAKE LINING

Oil Encased Drive With Spherical Bearings

BAY CITY WINCH



Type D Winch

ITS CAPACITY is 5000 pounds, which is nearly seven times its weight. In its construction the best materials have been used, such as steel drums, bushings of phosphor-bronze and self-aligning thrust bearings, etc.

The drum revolves freely and the friction-clutch provides easy engagement and release of the load.

Write us for full particulars

Bay City Foundry & Machine Company

1602 Water St. Bay City, Mich.

RADIATOR TUBING OF DURABILITY



Dominant on Battle Trucks and Aeroplanes

We number among our customers many of America's largest builders of tractors, trucks and automobiles.

Super-Cooling Efficiency

This Fin Tube type gives maximum cooling efficiency per cubic inch of core and per pound of metal used, as it combines free circulation of air with the greatest exposed radiating area.

The DALLAS Tubes are especially to be desired in truck and tractor radiator construction, on account of their *strength*. These tubes have no lap joints. They are either *double-lock joints* or seamless, and will stand 100 pounds or more pressure. They give straight water circulation, which does not clog with alkali, dust or solder. Get the details.

Fin Tube Radiators

They offer *strength* in the seamless, or double-locked 32 gauge (or heavier) metal, with few joints to loosen through vibration, and *efficiency* through *straight free circulation.*

Dallas Brass & Copper Company

223 North Jefferson Street Chicago, Ill.

LUEDINGHAUS TWO-TON CHASSIS

WORM-DRIVEN



Luedinghaus Trucks are built on a quality basis throughout, yet sold at a moderate price. They are built to perform satisfactorily under all conditions. They are economical in operation. They are constructed by a corporation of over 50 years' standing as successful manufacturers of transportation vehicles.

DEALERS—The Luedinghaus Franchise is a valuable and growing asset to any progressive dealer. Dealers wanted in territory not already represented. Write or wire at once.

LUEDINGHAUS WAGON COMPANY **St. Louis, Missouri**



Which Trucks Have the Best Record?

Many a truck equipped with every seeming contrivance for low cost-per-mile, yet lacks a Hub Odometer to tell what it all comes to, compared with the operating economies within its power.

It is true that Packard, Pierce-Arrow, Nash, Selden, Gramm-Bernstein and 30 others of the foremost use Veeder Hub Odometers as standard equipment.

But if you own or handle a make whereof mileage is guessed at and economy left to luck, be assured that a

Veeder



HUB ODOMETER

will put it in a different class from the standpoint of haulage-thrift and distance per dollar of operating cost.

The Veeder always adds mileage, whether truck runs forward or backward—totals cannot be falsified. Regular model, adaptable to all standard trucks, $20. Special model for FORD Commercial Cars, $15. Write for complete information.

The Veeder Mfg. Co.
10 Sargeant Street Hartford, Conn.

New York Distributor
Joseph T. Quinlan
5 Columbus Circle

Detroit Distributors
Geo. F. Balk Sales Co.
9 Selden Street

Chicago Distributors
Carey G. Wirick & Co.
564 W. Randolph St.

Pacific Coast Distributors to Jobbers and Dealers
F. Somers Peterson Co.
60 Pine St., San Francisco, Cal.

Middle West Service Station
Carey G. Wirick & Co.
Chicago

LEE LINE

Trailers—Bodies—Loaders

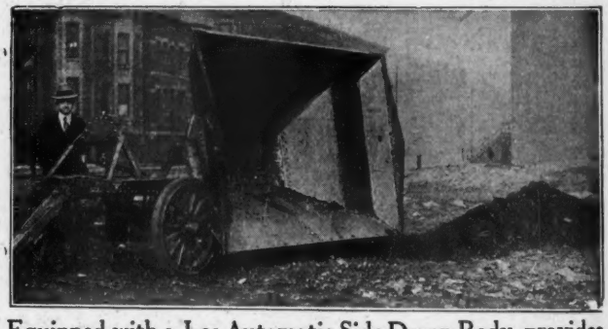
Drop Frame Trailers



Brings the loading edge within easy reach. Reduces lifting height from 18 to 30 inches. Saves time and energy.



A low center of gravity eliminates sidesway due to rough and uneven roads and limits danger of overturning when rounding corners at high speed. Lengthens life of equipment.



Equipped with a Lee Automatic Side Dump Body, provides an efficient vehicle for anyone with loose materials to haul. Especially suited to stone and gravel hauling and for collection of ashes and garbage by municipalities.

Chassis also provided with platform, stake or panel body for hauling any kind of merchandise.

If it is a Trailer, Semi-Trailer, Motor Truck or Trailer Body, or special handling or hauling equipment—we make it.

LEE LOADER & BODY CO.

Builders of Automotive Auxiliary Equipment

2333 So. La Salle Street Chicago

The Best Proposition You Can Make to the Ford Truck Owner

Every Ford Truck needs an Emco Radiator. It needs it to get better service out of its engine. It needs it to save wasting time in the repair shop.

The Emco Radiator is built to keep the Ford engine cool under the severe demands of truck service. It prevents boiling with the heaviest loads, on the steepest grades and in the hottest weather. With an Emco a Ford does more work with less wear and tear on the engine.

The Emco is built to resist leaks and damage. The tubes are of heavy gage, seamless drawn copper, strong enough to resist the effects of freezing. The tanks and frame are of malleable, practically indestructible. The Emco has the quality to outlast two trucks.

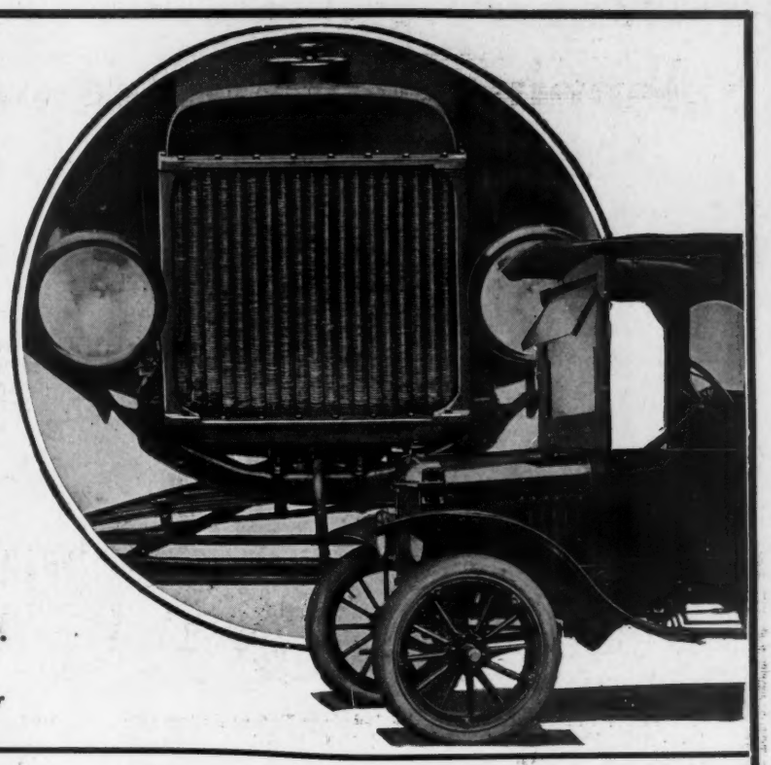
In fact, it is the biggest economy that can be put on a Ford Truck, and the big way in which it is selling proves that Ford owners are realizing this fact.

It will pay you to write us at once for information and terms. List Price $50.00.

THE MOTOR TRUCK RADIATOR & MFG. CO.

2, 3, 4 Columbus Circle, New York City

Manufacturers of the famous DORIC Radiator for FORD Passenger Cars



EMCO *Radiators*
for FORD TRUCKS

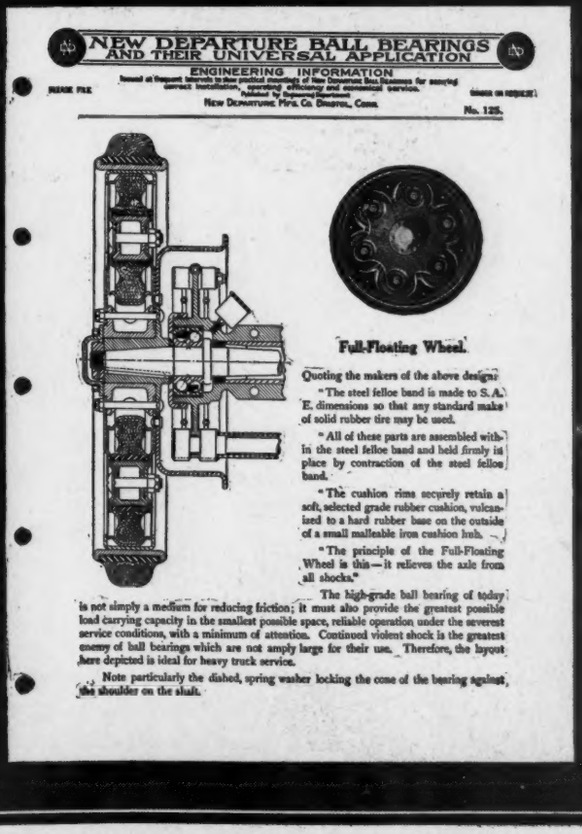
New Departure Ball Bearings

We show one of the New Departure Engineering Bulletins. There are scores of them, each one treating of New Departure ball bearing installation in different machines. We will be glad to send the whole set to you free if you are interested and will write on the letterhead of your firm, giving your official position

THE NEW DEPARTURE MANUFACTURING CO.

Detroit Bristol, Connecticut Chicago





NEW DEPARTURE BALL BEARINGS AND THEIR UNIVERSAL APPLICATION

ENGINEERING INFORMATION

Issued at frequent intervals to new practical members of New Departure Data Business for assuring correct installation, operating efficiency and economical service. Published by Engineering Department

NEW DEPARTURE MFG. CO. BRISTOL, CONN. No. 125.

Full-Floating Wheel.

Quoting the makers of the above design:

"The steel felloe band is made to S.A.E. dimensions so that any standard make of solid rubber tire may be used.

"All of these parts are assembled within the steel felloe band and held firmly in place by contraction of the steel felloe band.

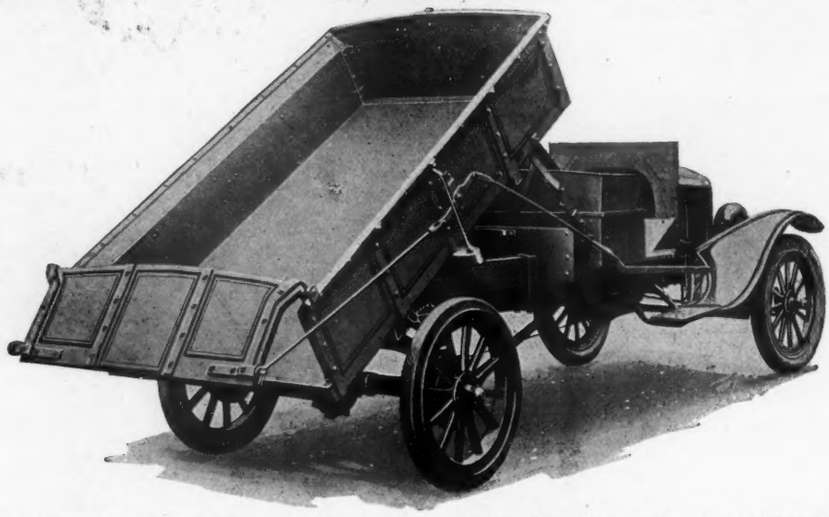
"The cushion rims securely retain a soft, selected grade rubber cushion, vulcanized to a hard rubber base on the outside of a small malleable iron cushion hub.

"The principle of the Full-Floating Wheel is this—it relieves the axle from all shocks."

The high-grade ball bearing of today is not simply a medium for reducing friction; it must also provide the greatest possible load carrying capacity in the smallest possible space, reliable operation under the severest service conditions, with a minimum of attention. Continued violent shock is the greatest enemy of ball bearings which are not amply large for their use. Therefore, the layout here depicted is ideal for heavy truck service.

Note particularly the dished, spring washer locking the cone of the bearing against the shoulder on the shaft.

Jennings Patent Automatic Dump Body
for Ford One-Ton Truck



The above illustration shows the Jennings Patent Automatic Dump Body mounted on a Ford Ton Truck. Capacity of Body, 1¼ Yards.

This is no experimental proposition; hundreds in use and all users loud in their praise.

No expensive hand or hydraulic hoist required to dump this Body, dumped by hand lever and load released in ten seconds.

Automatic locking device that holds body from dropping back. Not a piece of cast or malleable iron on job; all wrought iron, which can easily be replaced if ever broken by any blacksmith.

Also built for Reo, Maxwell, Oldsmobile, International Auto Car, and other makes of chassis in sizes from 1½ yards to 3 yards capacity.

Write quickly for agency proposition.

THE COLUMBIA WAGON COMPANY **Drawer B** **COLUMBIA, PA., U. S. A.**

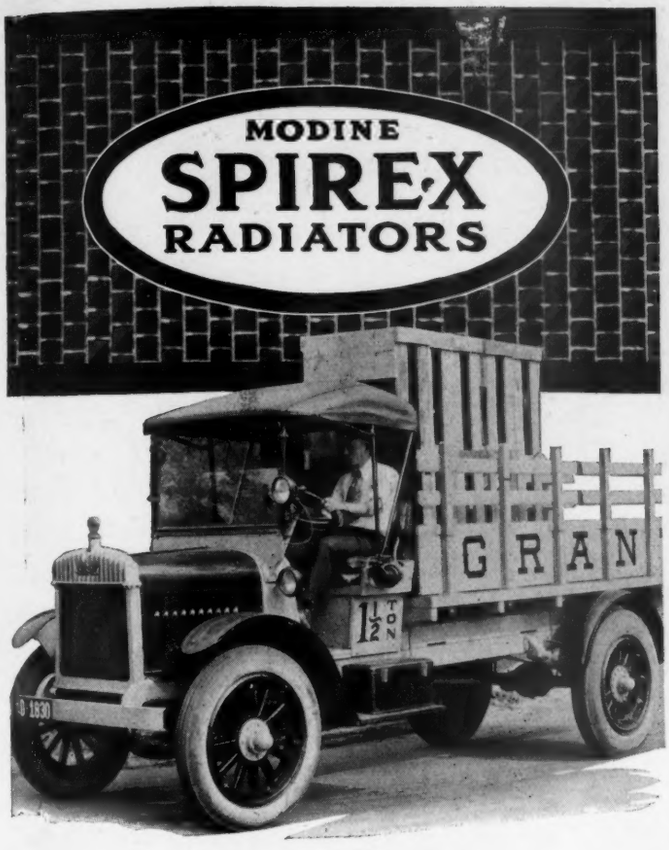
Pressed Steel Frames

The largest and best equipped Frame plant in the world

A.O. SMITH CORPORATION

MILWAUKEE

Detroit Office: 708 Ford Building



Cooling That Adds to Truck Life and Service

Efficient cooling safeguards the truck motor from a hundred and one different engine troubles caused by overheating that would result in loss of time—unreliable service and no end of repair bills.

A Modine SPIREX Radiator has a cooling capacity far greater than any other radiator yet designed.

This enormous cooling capacity is because of the advanced type of core construction—unusually large water channels and extra heavy copper radiator stock. A spiral strip of copper in each air cell forces the air against the side of the water channels—holding it there sufficiently long to enable it to absorb more heat than is possible in the ordinary radiator. In addition this particular core construction gives a reinforcement that greatly adds to the strength and durability of the radiator.

A new type of SPIREX Radiator can now be had with a sectional construction. Each section can be removed or put on in a few minutes' time. Think of the saving of time and repair bills—besides the increased number of days your truck is kept on the job.

For dependable, economical service make sure that the truck you buy is SPIREX equipped.

MODINE MANUFACTURING COMPANY
Racine, Wisconsin



—a new margin of wearing strength

at a reasonable price without excess weight. Every wearing part of the new Stoughton *Oversize* Truck is built for greater strain resistance and service.

The Stoughton *Oversize* Truck proposition offers unusual advantages to the dealer. The Stoughton name has been a well-known mark of dependability and extraordinary value for over fifty years. Stoughton *Oversize* construction eliminates service expense and keeps the truck permanently sold. There is both pride and profit in handling the Stoughton.

Write or wire for dealer proposition today.

The Stoughton Wagon Co.
Stoughton, Wis.

STOUGHTON
Oversize TRUCKS

EVERY DAY

Motor Truck Cab



Proper protection for the driver is again receiving greater attention with the coming of winter.

Truck buyers realize that an enclosed cab is a necessity, not alone to give the driver better working conditions, but also to insure greater tonnage handled. It means less idle time for the truck, for the driver can drive continuously, whatever the weather.

THE PERFECT CAB FOR ALL SEASONS

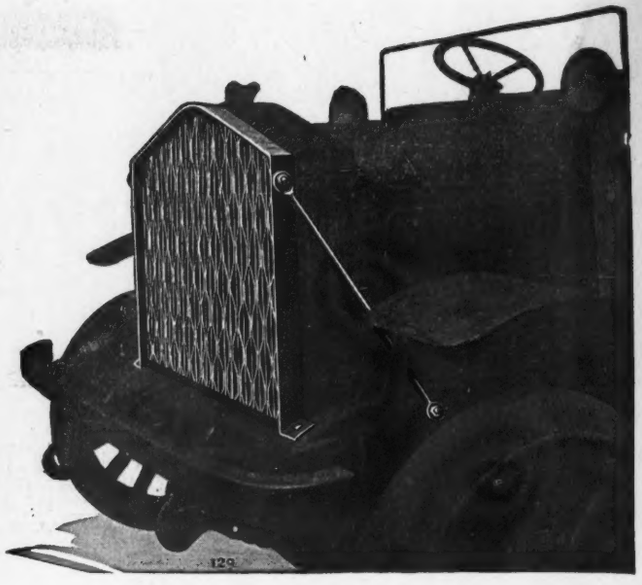
The EVERYDAY cab is quickly convertible to the needs of the season—completely closed for winter, semi-closed for changeable weather, and open in hot weather.

It is a ***Highland*** product, conforming to the same high standards of design, adaptability, material and workmanship as the ***Highland*** standard bodies.

Specify the ***Highland*** EVERYDAY cab on all your trucks. It will help sales and increase profits.

THE HIGHLAND BODY MFG. COMPANY
1117 Elmwood Place CINCINNATI, OHIO
Detroit Branch: Holden and Greenwood Avenues

(14)



IRVING
SHOCK-PROOF
RADIATOR GUARD

Gives Maximum Service Insurance

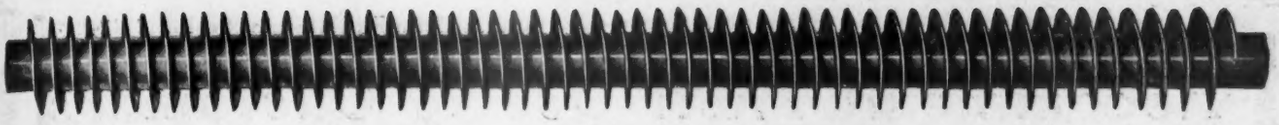
Continuous service is the key to maximum truck profit. Accidents cost far more in loss of service than in repair expense. A truck adequately protected against accident is worth more, sells more easily, earns more. An Irving Radiator Guard makes any truck a better, more profitable truck by giving it positive protection at its most exposed point.

The Irving Guard is a shock-absorbing, impact-resisting panel of Irving Subway grating—a truss-like structure of alternate straight and reticuline steel bars that distributes a shock over the whole panel and withstands a blow that would wreck any ordinary guard. While extremely light, it gives all the protection a solid plate could afford, but with an 80% opening for air circulation. Tests show that, weight for weight and span for span, the Irving Subway forming the Irving Guard will resist a greater shock or pressure than any other form of grating.

There's a size and style to fit your truck. Write for Circular 1B36, stating the make and model

IRVING IRON WORKS CO.
LONG ISLAND CITY, N.Y., U.S.A.
Manufacturers of

IRVING SUBWAY TRADE MARK
(PATENTED) REG. U.S. PAT. OFF.
THE FIREPROOF VENTILATING FLOORING



ROME-TURNEY HELICAL TUBE RADIATORS

Which were built nine years ago are still doing their full duty.

This is just one of the reasons why America's most exclusive makers of high-grade trucks continue to use Helical Tube Radiators.

Our new catalog contains valuable information for manufacturers, dealers and owners. Ask for it.

ROME-TURNEY RADIATOR COMPANY
ROME, NEW YORK, U.S.A.



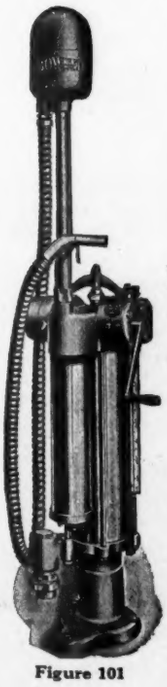


Figure 101

LOOK TO YOUR GASOLINE
FOR INCREASED TRUCK MILEAGE

After all has been said and done, it is the gasoline that determines the "Rolling Power" of your truck.

The truck and its load are moved only by the gasoline. The speed, power and service depend on the clean, rich purity of the fuel. With Bowser Systems this state of purity is maintained indefinitely. In addition to the convenience, cleanliness and economy with which oil and gasoline are handled by the Bowser Outfit, you have safety.

Write today—tomorrow never comes.

Portable Wheel Tank



Figure 154

S. F. BOWSER & CO., Inc., Ft. Wayne, Ind., U. S. A.
Canadian Office and Factory, Toronto, Ont.

London	Paris	Havana	Sydney
32 Victoria St., S. W. 1	5 Rue Denis-Poissons	Lonja del Comercio 427	6 Castlereagh St.

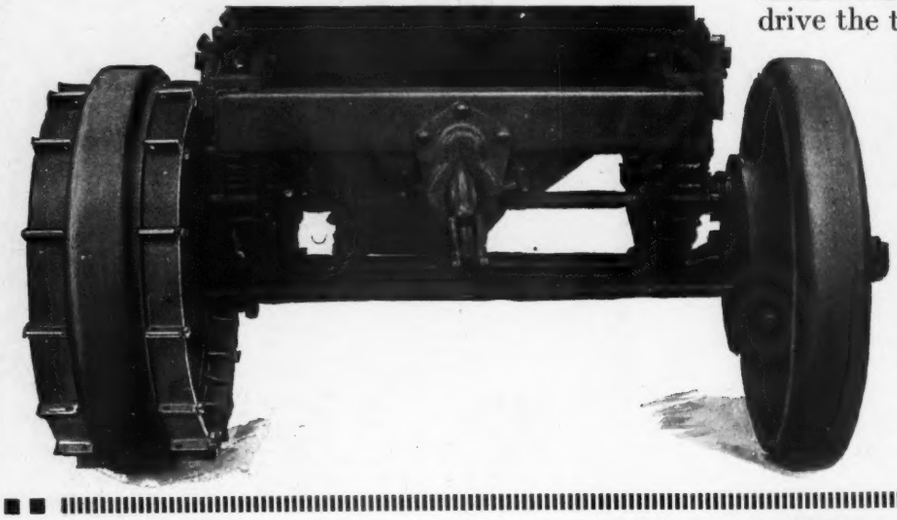
Recommend Their Use to Customers

FOLEY TRACTION RIMS

Every motor truck dealer should have a steady sale of these Traction Rims, that prevent miring and wasted effort. On a hard road surface they do not come into contact with the ground but the moment soft ground is reached, or mire is encountered, and the wheels sink, the Foley Traction Rims come into action.

Their broad rim surfaces furnish a grip that prevents sinkage and furnish sufficient traction resistance to drive the truck on to firmer ground.

This wheel is fitted with two Foley Traction Rims, which is the ideal arrangement where mechanical conditions permit.



Foley Traction Rims are made in two styles, both attachments being shown on the photograph below—a one-piece rim for outside use, and a two-piece rim for inside use, thus avoiding the removal of the wheel in applying them.

On chain-driven trucks, or where there is not a clearance of 2 inches or more, the wheel is fitted with one Foley Traction Rim in this manner.

FOLEY TRACTION RIM CO., INC.

827 Hennepin Avenue

MINNEAPOLIS MINN.

DETROIT

SEAMLESS STEEL TUBES

Manufacturers:

Cold Drawn Seamless Steel Mechanical Tubing, Locomotive Flues and Boiler Tubes

Detroit Seamless Steel Tubes Co.

Detroit, Michigan



An Ounce of Oakite Does the Work of One Gallon of Gasoline—

THIS Tire Factory has greatly reduced cleaning costs by washing its tires with Oakite instead of gasoline.

Now uses a solution of two ounces of Oakite to a gallon of water, and five ounces of Oakite in solution cleans as much tire surface as formerly cleaned by five gallons of gasoline.

Dangers incident to use of gasoline eliminated.

Highly satisfactory results at a *fraction of former cost.*

This Advertisement is one of a series based on actual occurrences.

In seeking advice on cleaning problems, look for broad experience and ability. It is the surest, safest way to find sound counsel.

How may we serve YOU?

OAKITE

MANUFACTURED BY

OAKLEY CHEMICAL CO.

38 THAMES STREET · NEW YORK

Success!

THE SUCCESS of the HART Roller Bearing is due to the *staggered* arrangement of the rollers. This unique construction greatly *reduces* the *bearing angle,* thereby relieving the bearing of much of the strain to which it would ordinarily be subjected, and greatly *increases* the load capacity.

These two cardinal points of superiority, coupled with other much-to-be-desired features, make the HART pre-eminent among bearings.

Let our Engineering Department work out your bearing problems with you

The Hart Roller Bearing Co.

Orange New Jersey

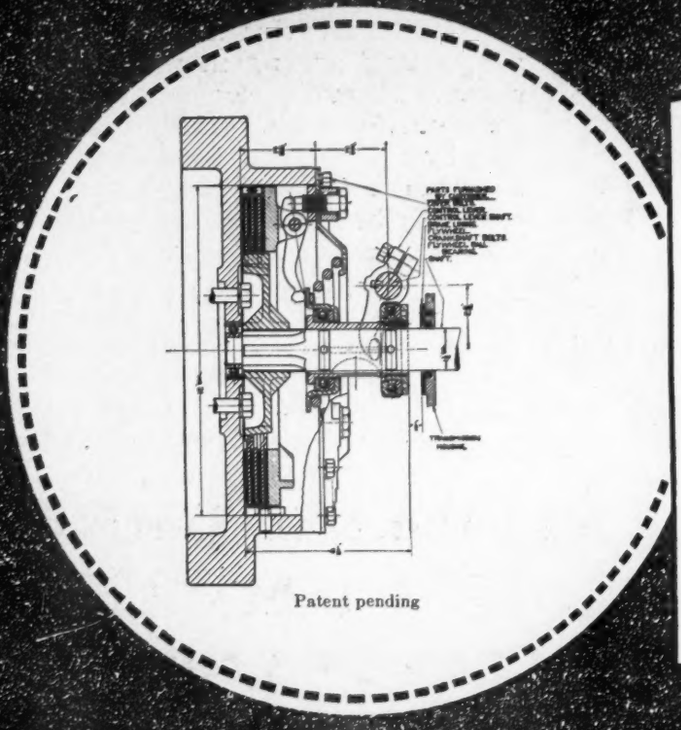


HART

STAGGERED ROLLER

BEARINGS

M & E Dry Disc Clutches



Patent pending

These clutches were expresly designed for installation in any Unit Power Plant construction, and will accurately fit into any standard S. A. E. Bell Housing. They are also applicable to any 10 or 12-inch open flywheel produced by motor manufacturers.

The main spring pressure is light (about 250 lbs.) and is multiplied upon the discs by three small levers, that have a ratio of about four to one, thus exerting about 1000 pounds final spring pressure on the discs.

The friction surfaces are very large, there being four discs, hence a much lighter pressure is obtained, and making a more simplified and smoother operating clutch in every way.

Write for details—Now.

MERCHANT & EVANS Co

NEW YORK PHILADELPHIA WHEELING
BALTIMORE CHICAGO
ATLANTA ST. LOUIS
CLEVELAND KANSAS CITY
DETROIT

DEPENDABLE Uses Buda Motor, Wisconsin Worm-Drive Axle, Dixie Magneto With Impulse Starter, Fuller Transmission.



DEPENDABLE Uses Long Radiators, Ross Steering Gear, Pierce Governor, Timken Bearings and Morse Viscometer.

DEPENDABLE—The Better Truck

There is always some one object which dominates its class—something which receives the stamp of public approval from the first.

Sometimes it's art—a wonderful picture from a master's brush, or a book from an inspired pen.

The world sees and applauds.

Or, some mortal conceives a city. Skyscrapers go up, railroads are built around it. And again the multitudes acclaim, "Well done."

And so there is always some one thing bigger than all others, winning public favor instantly with a character that sells itself—standing out on the horizon of successful achievement.

Just now it's a truck—DEPENDABLE—"THE BETTER TRUCK."

It will be of financial benefit for dealers to become acquainted with Dependable Trucks.

Our Claim's in Our Name—
"DEPENDABLE"—THE BETTER TRUCK

Dependable Truck & Tractor Co. Galesburg, Illinois

COUNTERBALANCED PARK CRANKSHAFTS

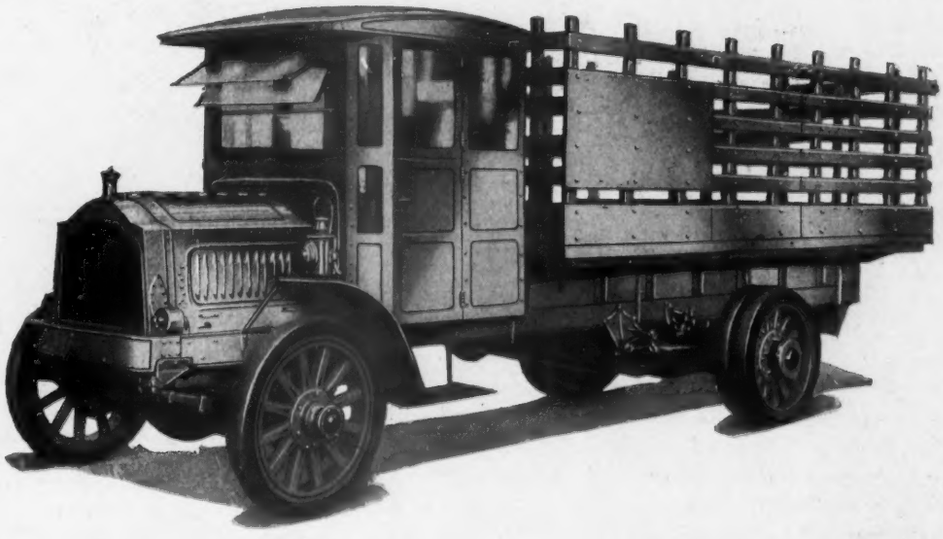
Patented July 10, 1917



We have shipped
88,899 Counterbalanced
Crankshafts up to February 7, 1920

THE PARK DROP FORGE COMPANY
CLEVELAND

BABCOCK BODIES



H. H. BABCOCK COMPANY
WATERTOWN, FOUNDED 1845 NEW YORK.



YOUR TRUCK'S WEIGHT

is a big factor in the decision of a buyer. No shrewd purchaser is willing to operate a heavy truck at big expense, if he can secure the same strength and service from a lighter assembly.

DETROIT PRESSED STEEL FRAMES

are equally dependable and as strong as heavier frames, but their lightness lessens the total weight of the truck so considerably that buyers are favorably influenced.

The makers of Detroit Pressed Steel Frames are also the manufacturers of Disteel Wheels.

Detroit Pressed Steel Company
Detroit U. S. A.

AN EXCELLENT HOIST



That Takes the Place of Five Men

Consider how much this saving in labor costs will mean to the concerns that buy your trucks. No matter what make of motor truck you sell, it is adaptable for the use of this time and labor-saving hoist. It occupies little space on the loading platform, and is easily operated by one man. Send for literature and complete descriptions, including prices and dealers' discount.

The Hydraulic Hoist Mfg. Co.
292 Walnut Street
St. Paul, Minnesota

Vertical Type Hydraulic Hoist

WOLVERINE 1½ Ton TRUCKS

This sturdy, dependable 1½ ton truck is built from tires to top on a basis of service-giving that carries conviction to the mind of every truck-wise buyer who sees it.

As an earnest of the high caliber of the whole car, we note above, a few of the principal parts. Comment on their standing in the truck industry is unnecessary. *Wolverine buyers get the same quality in every part and in every detail of construction.*

Points of Selling Punch

A reliable Continental motor supplies maximum power at minimum cost. The Wolverine is equipped with a starting and lighting system. Other features of construction are a Special Cast Shell Radiator; Russel Internal-Gear Drive Axle; heavy drop-forged front axle, equipped with Timken bearings; irreversible worm and gear Steering Gear; a heavy 5" channel section frame and heavy-duty artillery type wheels. Wheelbase, 140".



Truck Demand Exceeds Supply

Dealers—Don't lose sight of this fact. Trucks in the Wolverine class are being "snapped up" as fast as they can be promised. *We can ship promptly.* No waiting—no irritating delays. Your customers get delivery service on the dot, but—

We can take care of only a few more dealers and still make good on deliveries. Write or wire—*Now.*

The American Commercial Car Co.
Gratiot Ave. and Detroit Terminal Railroad, Detroit, Michigan

For Service and Appearance

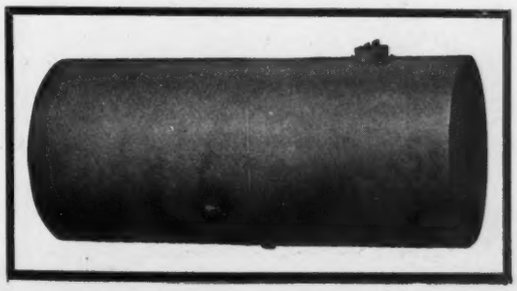


Sheet Metal Parts that receive careful consideration from buyers are selected on the basis of quality and style. The tendency is becoming more marked for motor truck makers to select

Sheet Metal PARTS

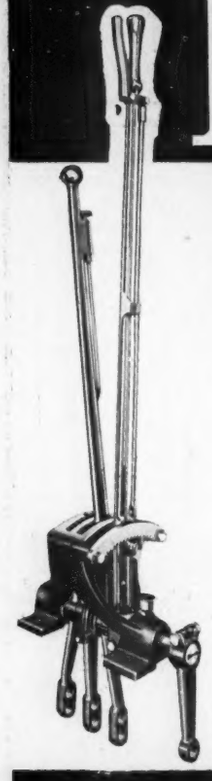
with the care and attention they deserve. Our Acetylene-welded Tanks, Fenders, Sod Pans, and Stampings are sturdily constructed to last with built-in quality that resists wear.

You can secure this certainty of quality and pleasing appearance as well at prices that are surprisingly reasonable. Consult us about Hoods, Fenders, Tanks, etc. We can satisfy you as to quality, deliveries and price.



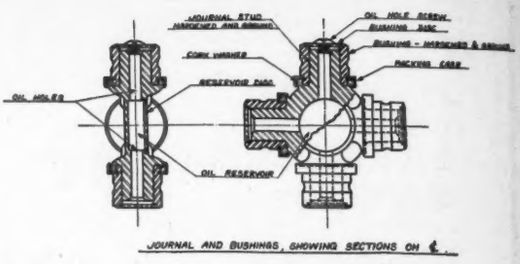
Motors Metal Mfg. Co.
Milford Ave. and P. M. Ry. Detroit, Michigan

BATAVIA CONTROL SETS UNIVERSAL JOINTS

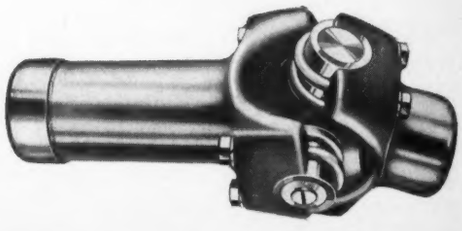


BATAVIA CONTROL SETS—A quality production. All levers drop forgings; base castings malleable iron; machined to gages insuring full interchangeability. All wearing parts heat-treated. Hand lever assemblies full nickel plated. Made for 3 and 4 speeds in several types of mountings.

BATAVIA UNIVERSAL JOINTS give Exceptional Service. OIL LUBRICATION. Cork Washers positively retain the oil and keep out dirt.



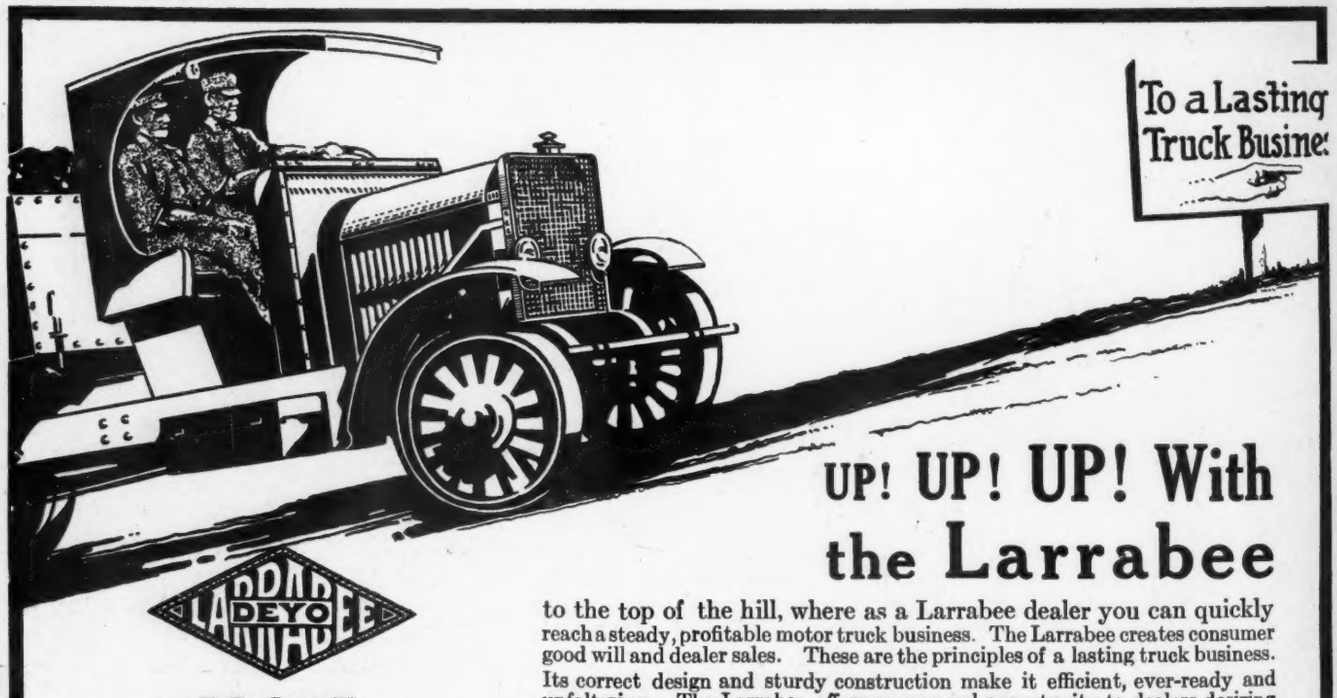
JOURNAL AND BUSHINGS, SHOWING SECTIONS CH ℄.



S. C. Kyle
Rialto Bldg.
San Francisco

BAKER GUN & FORGING CO.
Factory: Batavia, New York

Lonney & Carmichel
510 Washington Arcade
Detroit



UP! UP! UP! With the Larrabee

to the top of the hill, where as a Larrabee dealer you can quickly reach a steady, profitable motor truck business. The Larrabee creates consumer good will and dealer sales. These are the principles of a lasting truck business.

Its correct design and sturdy construction make it efficient, ever-ready and unfaltering. The Larrabee offers an unusual opportunity to dealers desiring to sell trucks that will establish a lasting business.

A complete range of capacities and capabilities makes it possible for the Larrabee to meet practically every truck requirement in your territory.

There are still a few valuable territories open—yours may be one. It will pay you to write for full particulars of our proposition.

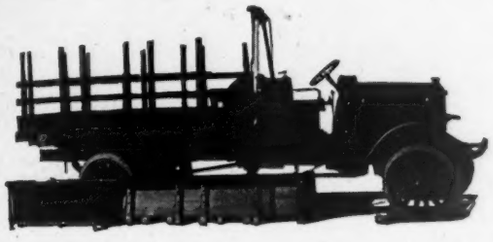
PROOF

The Larrabee is a good truck. It is so good that big fleet operators are choosing it exclusively over every other make. Ask us to prove it.

LARRABEE-DEYO MOTOR TRUCK CO., Inc.
Department of Sales
23 Washington Street Binghamton, N. Y.

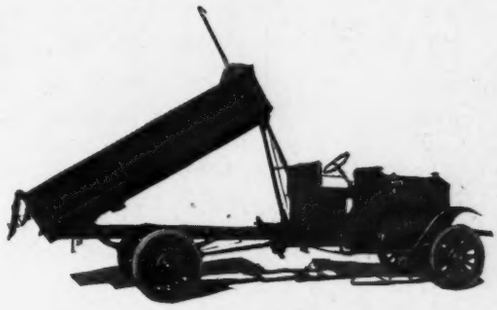
SIMPLEX Four Bodies in One

You cannot afford to handicap your truck with a body capable of only one line of service. It must be equipped to meet every need which arises and the Simplex "Four in One" is the choice of those who demand such efficient usefulness.



Here is the outfit. The possibilities are evident as is the simplicity of it. You can have the type of body to exactly suit the load in a few moments.

The hoist weighs only 237 lbs., yet will elevate the body in 40 seconds. When not in use, it is unobtrusive in every way; but when you need it, it is "on the job."

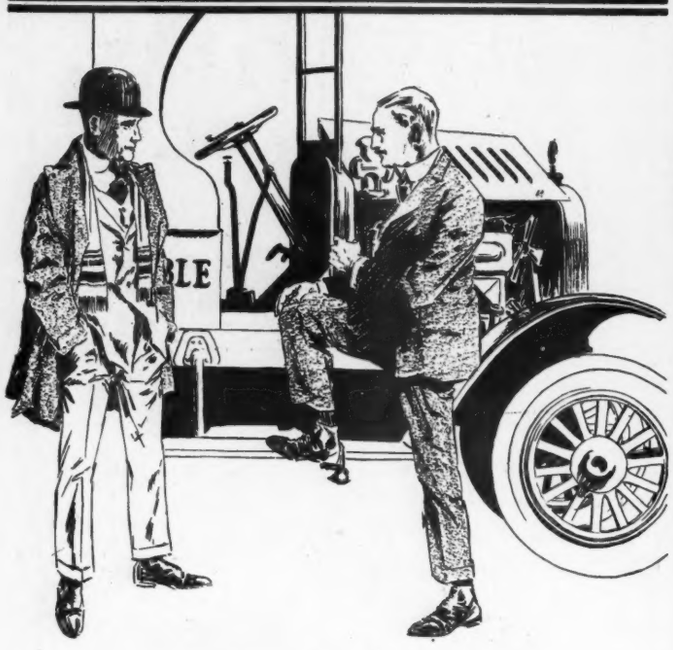


Price, weight, strength are points upon which we invite comparison with the obsolete equipment you have been used to. May we not give you further information?

Simplex Manufacturing Co.
CONNEAUTVILLE, PA.

U. S. Sales Agent
H. R. DAILEY
3028 Carroll Avenue
CHICAGO, ILL.





TALKING POINTS GALORE!

Why does the Noble dealer outstrip competition, and even in a new territory create an astonishing turnover of Noble trucks? The answer lies in the points of difference possessed by

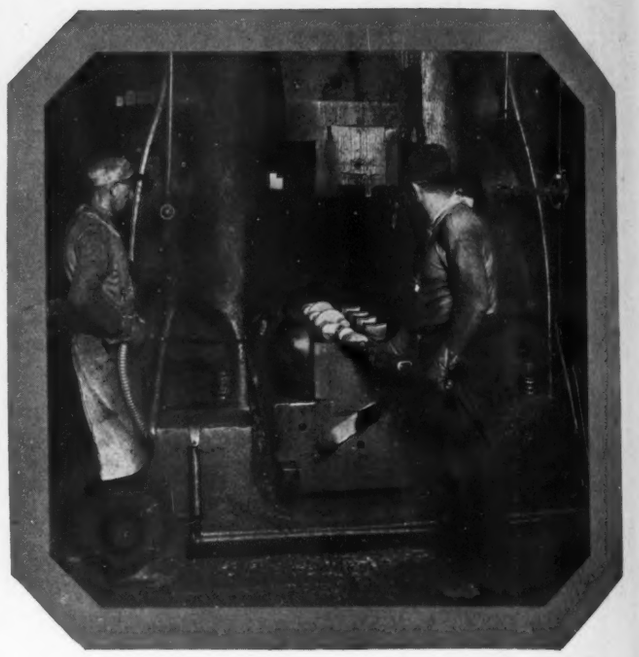
NOBLE MOTOR TRUCKS

Noble dealers have talking points galore to use in making sales. But the strongest argument of all consists in seating a prospect at the wheel and in letting him run a Noble truck.

Then it is that such parts as the Buda motor, Lavine steering gear, Pierce governor, Eisemann magneto, make themselves felt. The axles are Sheldon worm drive. The carburetor a Stromberg and the springs made by Tuthill. Every part is up to the highest standard. Interested dealers are urged to write for Dealer Plan.

NOBLE MOTOR CORPORATION
Kendallville Indiana





WHAT connection can there be between Character and Drop-Forgings? Let's see.

In a group of average men there does not appear to be any outstanding difference when everything is running *smoothly*. But, under the strain of a great occasion demanding the utmost strength of body and soul, the man of character assumes the responsibility, carries the load and shows that he stands head and shoulders above his fellows, tho undistinguished from them previously.

So, also, in Drop-Forgings, they may *look* very much alike and serve equally well until a great and unusual strain is thrust upon them—then their character is apparent.

And Williams' Superior Drop-Forgings embody the character of an organization which has devoted nearly half a century to making the best drop-forgings that can be made—dependable forgings that meet, adequately, any strain, whenever it comes.

Inquiries for dependable forgings solicited

J. H. WILLIAMS & CO.

80 S. Clinton St. Chicago, Ill.
80 Vulcan St. Buffalo, N.Y.
80 Richards St. Brooklyn, N.Y.

Williams' Superior Drop-Forgings



DON'T DO IT!

Don't waste the time and energy of good mechanics with old-fashioned shims. Bearing adjustments can be made accurately and quickly with laminated shims of

LAMINUM

The **MATERIAL** *for* **SHIMS**

The layers of brass, .002 and .003 of an inch in thickness, are simply peeled off with a knife-blade. The job is done in a jiffy—and well done, besides.

LAMINATED SHIM COMPANY
533 Canal Street New York
Detroit: Dime Bank Bldg. St. Louis: Mazura Mfg. Co. England: R. A. Rothermel, 24-26 Maddox St., Regent St., London, W. I.



CRAMP

PARSONS'
MANGANESE BRONZE
ROLLED WELDING RODS

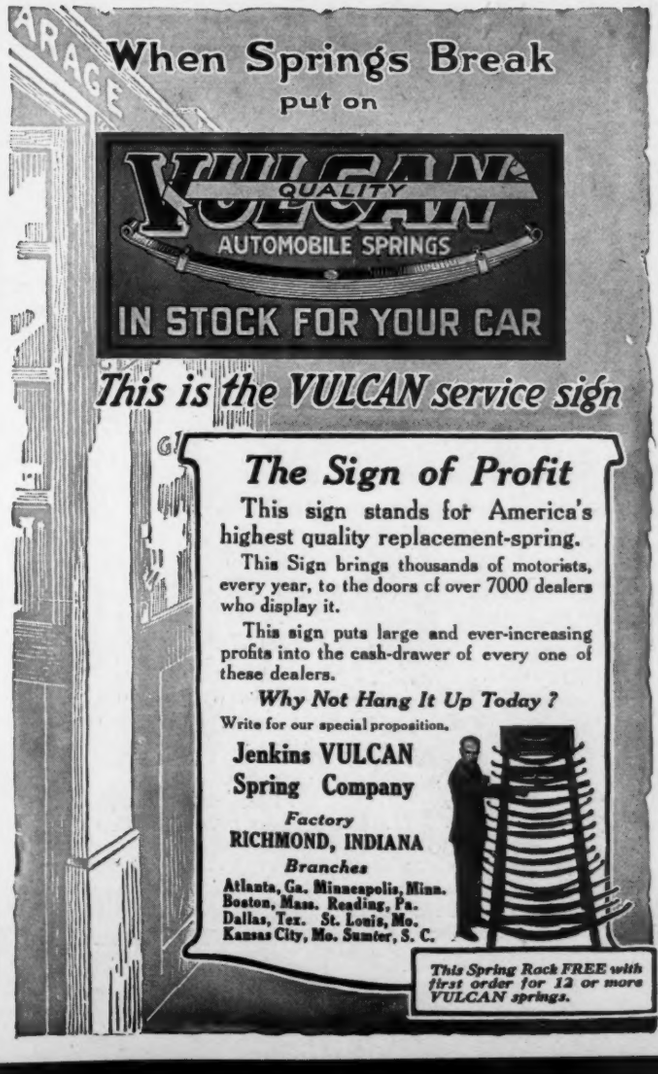
for high-fire Brazing and Oxy-Acetylene Welding of Malleable Iron or Bronze and Brass castings assure a faultless, flawless job. This is another example of the "Cramp" standard of quality. This scientifically perfected metal is the result of long years of experience. It is the strongest Bronze made and its fine physical properties make it especially suitable for welding purposes.

A strong weld of fine, close grain and exceedingly tough texture is always the result where Parsons' Manganese Bronze is used.

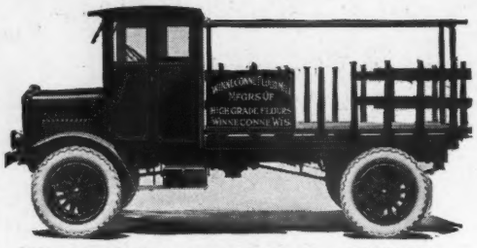
CASTINGS FOR AUTOMOBILES

We can furnish and will be glad to estimate on all kinds of Brass and Bronze castings for Automotive uses, completed and ready for installation, or on the Ingots and rough castings as desired. Parsons' Manganese Bronze, all Government compositions, Bearing Bronze, Hydraulic Bronze.

THE WILLIAM CRAMP & SONS
SHIP & ENGINE BUILDING COMPANY
PHILADELPHIA



OSHKOSH
FOUR-WHEEL DRIVE TRUCK



OSHKOSH 4-Wheel-Drive TRUCK

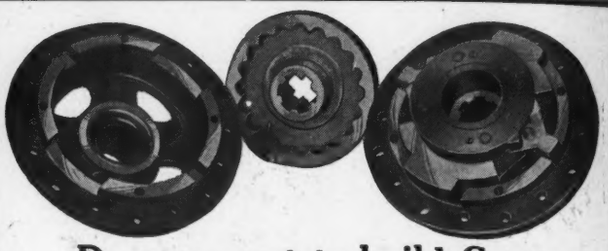
The "OSHKOSH" is a scientifically designed, carefully built truck. The maximum of the motor power generated is delivered to the four wheels — the rear ones *push* — the front wheels pull.

In the severest tests, the "OSHKOSH" Motor Truck proves its superiority — in everyday performance it substantiates all claims made for it.

Standard Equipment: Pneumatic tires, truck type, and electric lighting and starting system.

Write for full details and specifications.

OSHKOSH MOTOR TRUCK MFG. CO.
Oshkosh Wisconsin



Do you want to build Cars and Trucks that won't skid?

The Allen Differential
will enable you to do it

It is a gearless, frictionless, self-locking mechanism; provides a "dead" axle on straightaways; gives a positive two-wheel pull, and makes skidding almost impossible.

Increases motive power. Saves gas, tires, wear. Eliminates friction; lessens strain. Pulls through mud, snow or sand regardless of lost traction on either wheel.

What selling chance will your car or truck have against those that are equipped with Allen Differential?

Be one of the first to give buyers what they are demanding—it pays

Ask for full description

The East Iron & Machine Co., Lima, Ohio
Sole Lessee of Allen Patents for U. S. and Canada

Select the Standard

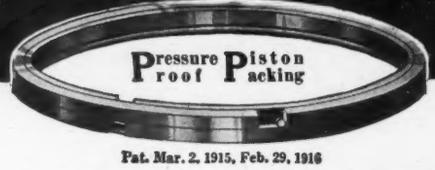


the Universal Joint used by the U. S. Government on all double "A" trucks.

Be absolutely certain that the Universal in *your* truck is good for the life of the assembly. The Standard is not only lacking in trouble, but its depreciation from constant use is but little. This is due to the absence of friction between working surfaces and to the excellent and continuous system of lubrication. Send us your specifications. We gladly estimate on your needs.

THE UNIVERSAL MACHINE CO.
430 RIDGE ST., BOWLING GREEN OHIO

PRESSURE PROOF PISTON RINGS



Pat. Mar. 2, 1915, Feb. 29, 1916

A glance at the construction of Pressure Proof Piston Rings shown below illustrates how the slightest groove wear is automatically taken up by the expander, by forcing the ring outward against the cylinder and upward against the groove.

Many automobile engineers and technical men have substituted for the old unsatisfactory remedies Pressure Proof Piston Rings, and in this way have effected an economical and simple method of curing oil pumpers, smokers, or whatever name you care to give a motor which consumes excessive oil.

Pressure Proof rings also eliminate excessive carbon and restore lost compression.

One Pressure Proof three-part, or two Pressure Proof Jr. two-part rings are a full piston equipment

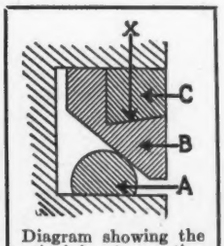


Diagram showing the principle of operation of Pressure Proof Piston Rings to be mechanically correct.

PRESSURE PROOF PISTON RING CO.
107 Massachusetts Ave.
BOSTON, MASS.

PRESSURE PROOF RINGS, Ltd.
Sherbrook, Quebec

GARY

Five Models

The 10 Test Truck

Built to Meet Your Requirements

Judge a truck before you buy it. Test it. Know what to look for—what to expect. Write at once for Frank Dawson's 10-Test Truck Investigation Plan.

Gary Motor Truck Company
Gary, Indiana U.S.A.

TRADE D.H. MARK

EGYPTIAN FIBRE

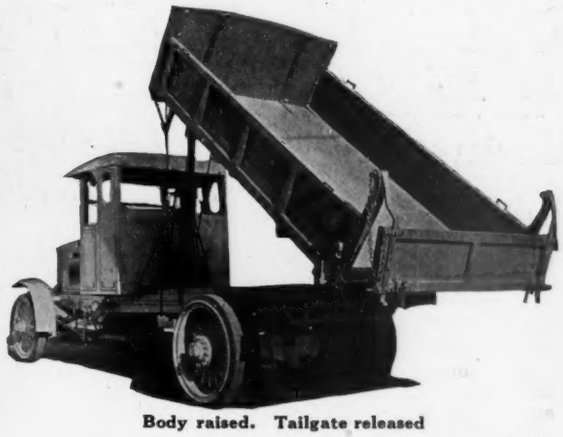
This is the toughest, most durable fibre known and is used by many truck makers for washers, gaskets, bushings, because of its superior qualities.

It is very durable, free from carbon, hard, and close-grained, slow to absorb and very resistant to shock.

Send for samples or consult our development department regarding their use in your trucks.

Delaware Hard Fibre Co.
Wilmington, Del.
NEW YORK OFFICE:
1358 Hudson Terminal Bldg.
CHICAGO OFFICE:
564-570 W. Monroe St.



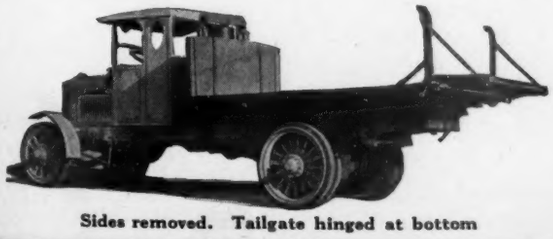


Body raised. Tailgate released

Combination CONTRACTORS' BODIES, PATENTED

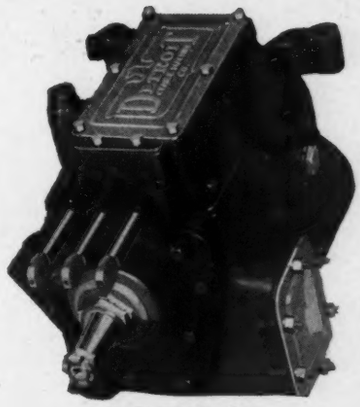
Four-in-one combination bodies designed for all forms of contractors' hauling.
Two capacities—2 to 3 tons and 5 tons. Send for illustrated folder.

METROPOLITAN BODY CO., Inc.
430 Grand St. Bridgeport, Conn.



Sides removed. Tailgate hinged at bottom

DETROIT TRANSMISSIONS
DETROIT GEAR & MACHINE CO.



MODEL H
TRUCK TRANSMISSION
4 SPEEDS
3 OR 4 POINT SUSPENSION
Amidship type, for 1½ to 3½ ton trucks

Detroit Gear & Machine Co.
Detroit, Mich.

There is "A Best" Always!

It is inevitable that in every industry, one product should take the lead, and consistently maintain its undisputed superiority.

This is what has happened in the wheel business.

SCHWARZ WHEELS

have attained this dominant position in the automotive industry because of their design and performance. The Schwarz design that dovetails the spokes into a rigid center assembly gives the greatest strength and enables Schwarz Wheels to bear burdens without breakdowns and to still remain in service.

NOTE THE WOOD WHEELS EVERYWHERE

PATENTED
The SCHWARZ WHEEL CO.
Frankford, Philadelphia, Pennsylvania

DAILEY MOTOR TRUCK BODIES
CHICAGO

FOUR BODIES
for
THE PRICE OF ONE

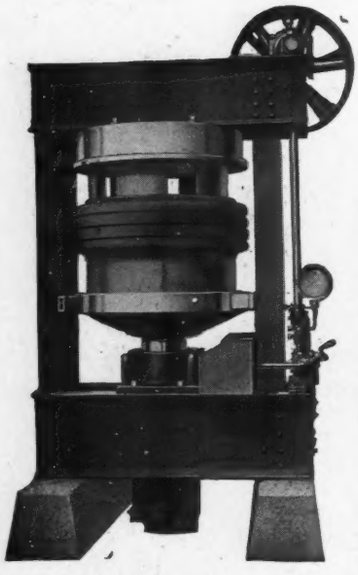
Write for booklets, dealer plan and full information about Dailey Bodies

H. R. DAILEY
AUTO TRUCK STEEL BODY CO.
3028 Carroll Avenue Chicago

Go After the Solid Tire Business in Your Locality

WITH A

W-S-M Tire-Applying PRESS



It's a comparatively simple operation to remove an old worn-out solid tire and replace a new one in its stead. Operators and users of solid tire trucks are always impressed with the ease and rapidity of the tire dealer's service, who uses a W-S-M press. Speed, simplicity and strength are its paramount features. Built in two sizes—150 and 200 tons pressure ratings. Write us for our interesting literature about its profit-making possibilities.

THE WELLMAN-SEAVER-MORGAN CO.
AKRON OHIO

MUTUAL
"America's Greatest TRUCK"

Attracted Marked Attention at the Chicago Truck Show

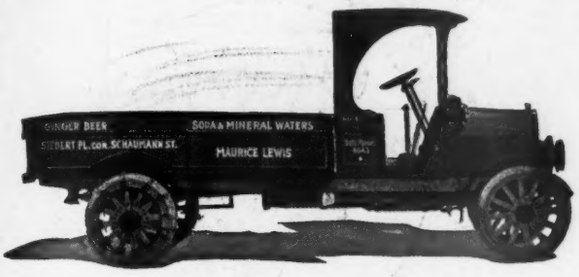
Of the hundreds of trucks exhibited there, *not one* embodied as complete an array of *super-specifications* as were shown in the Mutual.

It was a matter of comment that the more truck-wise a visitor was, the longer he stayed at the Mutual exhibit, and the more thoroughly he posted up on its every detail.

The Mutual Truck is built in 2 ton, 3 ton and 5 ton units, solid tires and 2½, 3½ and 6 ton pneumatics.

Send for Our Folder

Mutual Truck Company
Sullivan, Indiana
U. S. A.



1½ Ton Worm-Drive Chassis, $2150.00
2 Ton Worm-Drive Chassis, $2600.00

Buda Motor **Brown-Lipe Clutch**
Bosch Magneto **Timken Worm Drive**
Brown-Lipe Transmission
Timken Bearings Throughout

This high-grade Transmission and Power Plant is mounted on a chassis exceedingly well designed and very substantial.

You will find this a profitable line to handle.

The durability and efficiency of these trucks enable you to secure your customers' repeat orders and build up a clientele of satisfied users.

Sullivan Motor Truck Corporation
Rochester, N. Y.

Truck Manufacturer

Are you interested in

Prompt Deliveries

OF

Universal Joints

Doubled Capacity—Standard Product



"Essentially a Truck Joint"

Blood Bros. Machine Co.
Pioneer Makers of Universal Joints
Allegan **Michigan**

NIEHOFF TEST-KART



The latest achievement in the way of a complete testing outfit for quickly locating all electrical troubles in the ignition, starter, generator, battery, wiring, relays, meters; in fact everything connected with the electrical mechanism of an automobile, truck, or tractor. It can readily be wheeled about, which makes it exceptionally handy in large service stations. Complete records and instructions can be made on the spot. Storage battery fits right in the wagon. It is the ideal rig for general automotive service stations. Write for further information.

Paul G. Niehoff & Company, Inc.
232-242 E. Ohio Street **Chicago, Ill.**

It's a "Cinch"—

to lift an engine out of a chassis or to do any other heavy lifting job with a

Ford Hoist

Then, too, the best chain, drop-forged steel hooks, and rugged construction of all parts, keep it on the job and out of the repair shop.

Made in capacities up to 3 tons. What size do you need? A line brings our bulletin and price to you.



Ford Chain Block Co.
2nd & Diamond Sts. **Phila., Pa.**

Over-seas Representatives
Allied Machinery Co. of America
51 Chambers St., N. Y., U. S. A.
Paris Brussels Turin
Barcelona Rio de Janeiro

(2162-D)

WINTHER
MOTOR TRUCKS
KENOSHA WIS.

The one complete line of high-grade motor trucks—seven sizes of Winther (Rear Drive) 1½ to 7 tons capacity, four sizes of Winther-Marvin (4-Wheel Drive) ¾-1 ton; 1½ ton; 2½ ton.

Winther Motor Truck Company
KENOSHA, WIS.

Schatz
UNIVERSAL
Annular
BALL BEARINGS

Three area contact, ability to take 300% to 400% greater thrust load than any other annular bearing; these qualities distinguish the *Schatz Universal* from ordinary ball bearings.

THE FEDERAL BEARINGS CO., Inc.
Poughkeepsie, N. Y.
Great Britain: 37 Sheen Road, Richmond, London

Three Area Contact

IRON CITY
Springs

Pyrometrically controlled heat treatment and thorough testing assure dependable performance. Let us quote on your needs

have earned their present prestige and sound reputation as a result of dependable service and performance. Truck makers who include them in their assemblies know that they can place the full measure of responsibility upon them.

Iron City Spring Company
Pittsburgh, Pa.
Factory Representative
THOMAS J. WETZEL
New York Detroit

CUT
GEARS

FOR
TRUCKS AND TRACTORS

THE
MACHINE PRODUCTS CO.
OFFICE AND WORKS
EAST 179TH ST. AND ST. CLAIR AVE.
CLEVELAND
OHIO



Strength Stamina

Weidely Bulldog Motors

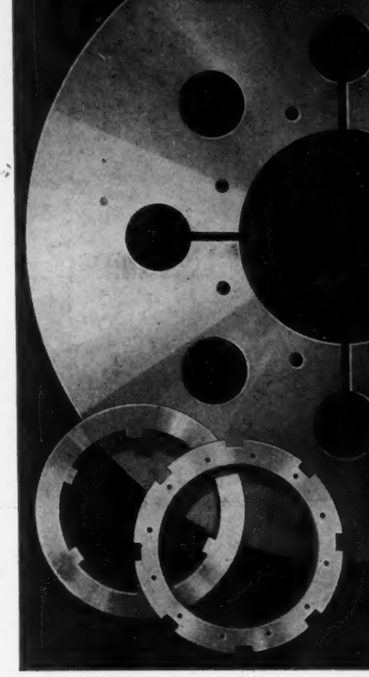
for Automotive Power

The remarkable staying powers of Weidely "Bulldog" Motors are vouched for by thousands of users over a long period of time. Engineers have endorsed the Weidely design and construction. Used on Cleveland Tractors for years.

Built to meet your requirements for tractor, truck or passenger car service. Our plant is completely equipped with highly specialized machinery for quantity manufacture. Our engineering department will send you complete specifications and data. Let us send you our latest Bulletins.

WEIDELY MOTORS COMPANY
Main Office and Factory
Indianapolis, Ind., U. S. A.

CURTIS CLUTCH DISCS



CURTIS Steel Clutch Discs are furnished in high carbon or soft steel, plain or slotted, flat or formed, unfinished or ground and polished, tempered or untempered — any size.

CURTIS SAW COMPANY
1635 Kienlen Ave.
St. Louis Missouri

TRADE
HORIZONTAL HYDRAULIC
MARK
DUMPING UNITS

The advantages of this equipment are many. Ground clearance of chassis is not interfered with, no portion of unit is higher than chassis seat and the hoisting strains are on those portions of chassis frame that are well supported.



Horizontal Hydraulic Hoist Co.
35 Twenty-fifth St., Milwaukee, Wis.
SALES AND SERVICE STATIONS:
Detroit—605 Gratiot Ave. Chicago—3755 Wentworth Ave.

GRANT TRUCKS

One-and-a-half and Two-tons

Complete Equipment
Electric Starting and Lighting

Write for interesting dealer proposition

GRANT MOTOR CAR CORPORATION
Cleveland

TITAN

Contractors' and Highway Transport Trucks
3½ and 5-6 Tons
THE TWO BIG FIELDS TODAY



LIVE AGGRESSIVE DEALERS
Big or Small

can obtain a liberal sales proposition on TITAN TRUCKS that will insure a good profit on every sale.
The reputation of TITAN TRUCKS is established; repeat orders are numerous; service cost practically eliminated, because the trucks are built right at the factory. Quick deliveries. Write for Contractors' Bulletin No. 20, and "Hi-Way Transport" Bulletin No. 44.

TITAN TRUCK CO.
MILWAUKEE · · · · · WISCONSIN



Hooven Honeycomb-Tubular Radiators for trucks have the three essential requirements, developed to the highest point.

They are strong, light, and continuously cool. Hoovens have proved these qualities on many trucks, and especially on Fords.

HOOVEN RADIATOR CO.
CHICAGO, ILL.

HOOVEN RADIATOR

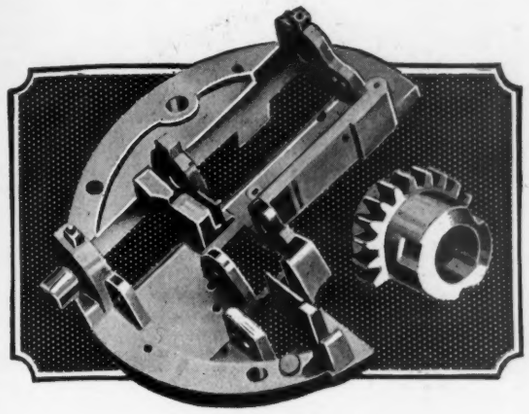
FAFNIR
Ball Bearings



THE FA... BEARING COMPANY
New Britain, Conn.
DETROIT Office, 752 David Whitney Bldg. CHICAGO Office, 1301 Michigan Ave.
CLEVELAND Office, 916-917 Swetland Bldg.

Wilson
"That's Haul"

J. C. WILSON COMPANY
Detroit Michigan



Speedometer Parts

Die-Cast by Doehler

No matter how complicated that part may be, do not decide it cannot be die-cast until our engineering staff has seen it; the chances are that Doehler can die-cast it in a finished form—accurate and ready for assembling.

Write today—tell us the problem

THE WORLD'S LARGEST MANUFACTURERS OF DIE CASTINGS

DOEHLER DIE-CASTING CO.

MAIN OFFICE AND EASTERN PLANT BROOKLYN, N.Y. CENTRAL PLANT TOLEDO, OHIO. WESTERN PLANT CHICAGO, ILL.

SALES OFFICES IN ALL PRINCIPAL CITIES

DDC-1

Cut Your Truck Repair Costs

THE man in charge of a fleet of motor trucks is a thorough business man. He thinks in terms of long-run efficiency. He is vitally interested in *saving money* for his concern.

That's why the experienced fleet manager no longer lays up a truck in order to repair leaks in the cooling system. He has given instructions to use "X" Liquid—the *scientific method for repairing leaks quickly and economically.*

PRICE $2.00

Will do a $150 Repair Job

Makes truck cooling systems

LEAKPROOF
RUSTPROOF
SCALEPROOF

"X" LABORATORIES
25 W. 45th St., New York



TRAGESER TANKS

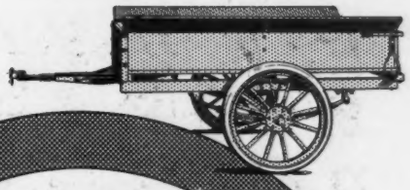


No. 16 Gauge Steel
Terne Coated
All Seams Welded
No Rivets—No Solder
Deliveries Guaranteed

Write for Catalogue

Established 1850

John Trageser Steam Copper Works
447-457 West 26th Street New York City

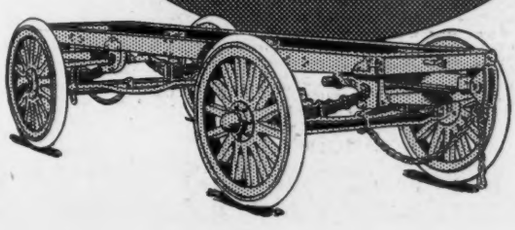


Farmers need trailers. Stockmen need trailers. Merchants in every line of business need trailers. Industrial concerns need trailers. The business is ready and waiting for every dealer who goes after it and goes after it right.

OHIO TRAILERS

The Ohio Trailer Dealers' Proposition will prove of more than ordinary interest. Write or wire for it today.

The Ohio Motor Vehicle Company
16 Oakview Road Cleveland



THE Sanford MOTOR TRUCK

2½, 3½, 5 Tons

Worm Drive

To the Front

Sanford Trucks



Sanford Model W-25, capacity two and one-half tons. Bought by the Griffith & Pierce Contracting Co., Utica, New York

Meets All Requirements

Present-day construction work calls for the superlative in truck operation.

The number and the quality of the orders received for Sanford Trucks indicate how the Sanford stands with representative firms.

Sanford Motor Truck Co., Syracuse, N. Y.

ADAMS AXLES

Represent Advanced Thought in Axle Construction

A

When you think of Axles—

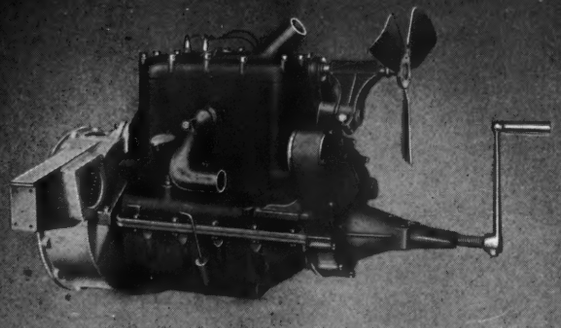
Think of Adams

Adams Axle Co. Findlay, Ohio

Detroit Office: 1401 Kresge Building
W. D. Rockwell, Mgr.

L. M. F. MOTORS

For Trucks and Tractors



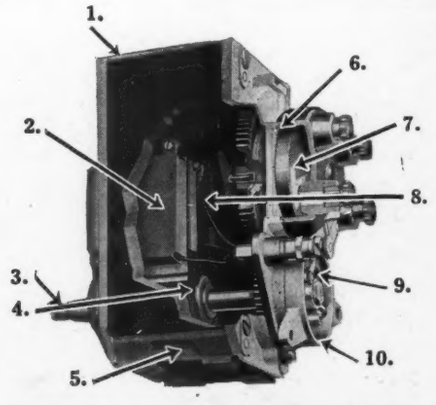
L. M. F. Motors Show the Way

3¼ x 4½ four cylinder, 1¼" Diameter crankshaft; 3½ x 4½ four cylinder, 2" Dia. crankshaft.

What our customers say of our motors: "We are using the LIGHT motor in our trucks and are going to continue to use them, as we consider them as good, if not better, than any motor of the same size made in this country."

Write us today for complete information

Light Mfg. & Fdy. Co. Pottstown, Pa.



DISTINCTIVE FEATURES of the TEAGLE MAGNETO

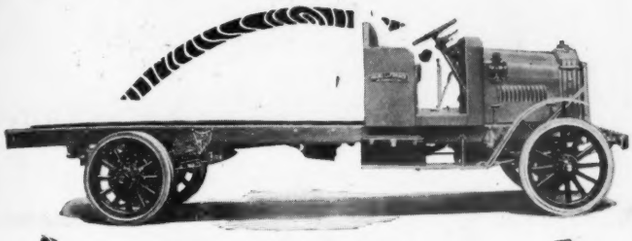
1. Straight Bar permanent magnets which will NEVER DEMAGNETIZE.
2. Mica, Tinfoil Condenser properly insulated and mounted.
3. S. A. E. Standards used throughout for Drive Shaft and Base Dimensions.
4. Well-balanced Flux Interrupter mounted on Norma Precision Bearings, elimination of moving wire, slip rings and contacts.
5. Cast Iron Base. Magneto can be mounted on cast iron engine pad without the use of an insulating plate.
6. Dust-proof, water-proof construction.
7. Substantial distributor. Parts readily accessible.
8. Insulated Stationary High-Tension Coil.
9. Well-designed breaker parts readily accessible.
10. Rugged breaker housing and shifting device, giving 30° advance.

The "Teagle" Magneto gives a better, hotter spark in a simpler way—a magneto designed to withstand the severe condition of tractor service. Write us for complete information.

THE TEAGLE COMPANY
CLEVELAND, OHIO

Opportunity

For a Few Dealers



The Ward LaFrance

Offers a few enterprising dealers in certain territories a splendid opportunity to establish a profitable business and become the leading truck dealers in their communities. One of the big, outstanding characteristics about the Ward LaFrance is its exclusive system of automatic lubrication by means of oil reservoirs and wicks that supply clean oil—not grease—as it is needed. Depreciation is lessened in this perfectly lubricated motor truck.

Write us for particulars

Ward LaFrance Truck Corp.

Desk No. 12
Elmira, N. Y.

WE FINANCE

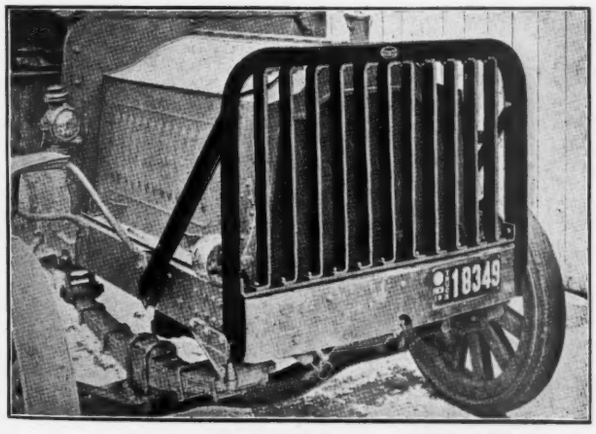
AUTOMOBILES AND TRUCKS

Floor Plan
Time Sales

No Red Tape Necessary

Write for particulars

Transportation Finance Company, Inc.
WILDER BUILDING
ROCHESTER, NEW YORK



Protect Your Truck

MANSFIELD
STANDARD TRUCK GUARD

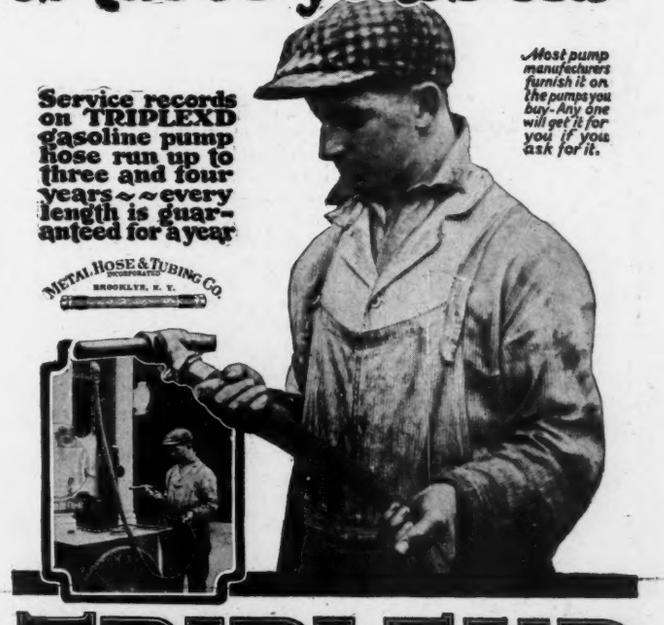
will save its cost many times during the life of the truck by protecting the radiator. Get our quantity prices. We have a gigantic plant, capable of meeting your largest requirements on time. We manufacture pressed steel truck bodies, dump bodies, steel bodies for Ford trucks, steel truck and tractor frames, pressed steel parts, hand-forged front tow hooks, etc.

Our ADJUSTABLE TRAILER AND TOW BAR ATTACHMENT is the strongest on the market and can be applied to any truck in about one hour—the only tools required are a breast drill and wrench.

Write us for specific information

MANSFIELD STEEL CORPORATION
Detroit, Mich.

"that darned hose is three years old"



TRIPLEXD

XXX GASOLINE HOSE XXX

TRADE MARK REG. U.S. PAT. OFF.

Every Length of Pump Hose Guaranteed for One Year's Service

Pneumatic Tired Truck Wheels
TO FIT ANY MAKE OF TRUCK



FOR FORD TRUCKS

Size of Tire	Price, Per Pair
32 x 4½ in.	$155.00
33 x 5 in.	185.00
34 x 4½ in.	165.00
35 x 5 in.	200.00

FOR LARGE TRUCKS

36 x 6 in.	$300.00
38 x 7 in.	400.00
40 x 8 in.	500.00
42 x 9 in.	625.00
44 x 10 in.	750.00

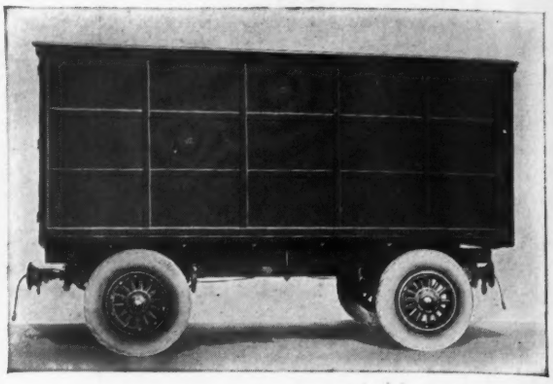
All Tires Are Non-Skid Cord

Above prices are for two wood wheels with demountable rims and tires mounted. Also includes spare rim and wrench and excise tax.

DISCOUNT TO DEALERS

Prompt Deliveries

LUVERNE AUTO COMPANY
LUVERNE, MINN.



Arcadias on Pneumatics

A 3½ Ton Arcadia on 40 x 8 Pneumatics
Bodies Also Built by Us

Four Wheel Trailers—1 to 5 tons
Semi-Trailers—2 to 6 tons
Log and Pole Trailers—2 to 6 tons
With pneumatic or solid tires.

Can you correctly figure a transportation problem without considering Trailers? Do you want to know more about Arcadia Trailers? Write for "Trailerisms."

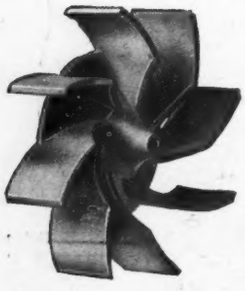
TRAILERIZE YOUR TRUCK WITH ARCADIA THE LEADING TRAILERS NEWARK, NEW YORK STATE

Arcadia Trailer Corporation
19 Murray Street
Newark New York State
Automotive Products Corp., Woolworth Bldg., New York, Sole Foreign Representatives

Do You Buy Die Castings on Specifications?

YOU don't specify the medicine your physician shall furnish—nor the advice you shall receive from your attorney. You employ men of recognized standing in their professions and accept their recommendations.

Many manufacturers have a similar feeling toward the Precision Organization. They realize that these Engineers have had many years of experience in the designing of die-cast parts, the making of dies and the alloying and casting of metals.



They have found that Precision Engineers work in as close harmony with them as their own designers. They have seen many examples of cost reduction and speeded-up production due to the hearty co-operation of these experienced men.

We can help *you* as well.

Send blueprints or models and let us show you how Precision Die Castings can serve you economically and efficiently.

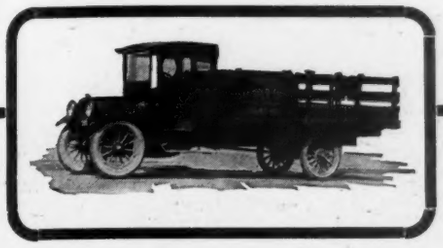
PRECISION CASTINGS COMPANY, INC.
SYRACUSE. PRECISION CAST NEW YORK.

Graham Brothers

Manufacturers

Motor Trucks
Farm Tractors

Evansville
Indiana



CONVERTED TRUCKS MAKE GOOD FRIENDS

Detroit Universal Truck Attachments equipped with Russell Internal Gear Axles make good friends because only the best materials and most skilled workmen build them.

A converted truck, passenger and light commercial car converted with Detroit Universal Truck Attachments give the same service as a new one, at a big saving.

We recommend converting the Reo ¾ Ton Speed Wagon, because it gives the same service as a new truck of 2 or 3 tons.

1¼, 2 or 3 Tons—$455 to $850

CARRIER MOTOR TRUCK COMPANY
Detroit, U. S. A.

Detroit UNIVERSAL Truck Attachments

GOES ON LIKE A HUB CAP



NO DRILLING NO PINNING

DREADNAUGHT
Indestructible Hub Odometer
With Automatic Drive
SALES AND SERVICE

Atlanta	Los Angeles	Providence
Boston	Milwaukee	San Francisco
Buffalo	Newark	St. Louis
Chicago	New Haven	Seattle
Cleveland	New Orleans	Washington
Detroit	Philadelphia	London, Eng.
	Pittsburgh	

AMERICAN TAXIMETER CO., 16 West 61st Street, NEW YORK

GET OUR NEW CATALOG "V" SHOWING

BANTAM

The BANTAM BALL BEARING CO.
BANTAM, CONN.

USED ON THE BEST MOTOR TRUCKS

THE BANTAM BALL BEARING CO.
BANTAM, CONN.

Standardized Air Brake Equipment

brings to the Motor Truck Industry the same Safety, Economy and Reliability that it has to the Railroads.

The Parker Pneumatic Control is a system of Air Brakes composed of Standardized Units designed especially for Motor Vehicles and suitable for mounting on any Truck or Trailer.

We are prepared to design mountings for the various units to conform to the structure of your truck or trailer. Send for catalogue

The Parker Appliance Co., Inc.
Cleveland, Ohio

TOWER TRUCK
STRENGTH + SERVICE

"The Freight Car of the Highways"

Tower Motor Trucks are so adequately fulfilling every trucking requirement that their rapid adoption is the logical result.

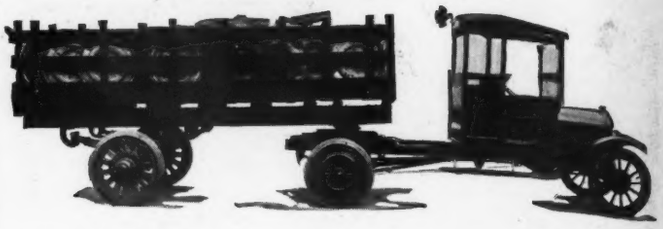
The Tower is built in 1½, 2½ and 3½ Ton Carrying Capacities.

Write for Catalog

Direct Factory Branches:

Minneapolis Chicago Detroit Indianapolis

TOWER MOTOR TRUCK COMPANY
GREENVILLE MICHIGAN



King Trailers Help Sell Motor Trucks

By doubling the capacity of a motor truck, the King Trailer enables dealers to offer customers a haulage unit at greatly reduced cost.

A 5-ton King Trailer and a 2-ton truck cost only slightly more than half as much as a 5-ton truck—do the work of a 5-ton truck with an operation expense only 10 per cent greater than that of a 2-ton truck.

With an increased production, we are in position to enlarge our distributing organization. Write for our dealer proposition.

King Trailer Company
601 Main Street **Ann Arbor, Mich.**

King Trailers
Decrease Your Hauling Expense~

The Key to a Big Business



Any Dealer who will grasp the opportunity can commence to build a business for himself that in time may become greater than his present work. In your locality there are hundreds of firms, large and small, who need solid tire replacements frequently. If you own and operate this

EXCELSIOR
225 TON
Tire Applying Press No. 34

you can get this profitable business. Not only are your charges for pressing on solid tires profitable, but you can sell many solid tires as well.

Write us or the U. S. Tire Company for terms of purchase.

Excelsior Tool & Machine Co.
East St. Louis, Ill.



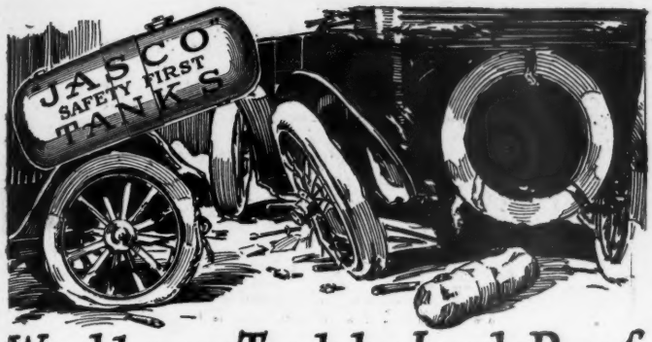
S & P Makes Valve Grinding a Pleasure

An average increase in sales of over 70% per month for the past five months is downright evidence that S & P Valve Grinding Compound DOES DELIVER THE GOODS.

Remember S & P Brand is packed in the Yellow Can. We Guarantee that it gives the quickest and most practical results with hand or power driven tool.

Send for your Free Sample—mention your Dealer's or Jobber's name.

S & P Manufacturing Company
163 Columbus Ave. **New York**



Would your Tank be Leak-Proof after a jolt like this?

"Jasco" Tanks withstand the hardest usage. For years, passenger and commercial car owners have found them to be absolutely leak-proof in severest service of every day use and emergencies as well.

"JASCO" TANKS

are perfect in all details of construction. They are made of the finest quality of drawn steel—seamless, leakless, safe and thoroughly tested.

Deep Drawn Steel Shapes

Increased factory facilities enable us to handle large contracts for deep drawn steel work. Tell us your needs.

JANNEY, STEINMETZ & CO.

Main Office: PHILADELPHIA
New York Office: Hudson Terminal Bldg.

S-M-G
TRADE-MARK REGISTERED U. S. PAT. OFF.

WE OFFER HELP

Orders from every direction indicate a likely shortage of brake lining.

Are you protected well in advance?

Are you getting deliveries per order and on time?

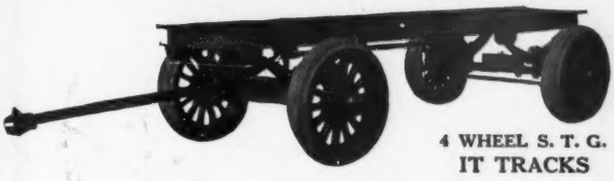
If not, send us your order at once, thus protecting yourself on time and deliveries. We can take care of you over the difficulty, but we urge immediate action.

STAYBESTOS MANUFACTURING CO.

5523 Lena Street Philadelphia, Pa.

Equipped to Manufacture All Widths Up to Six Inches

ROGERS
ALL-STEEL TRAILERS



4 WHEEL S. T. G.
IT TRACKS

YOU KNOW

What Trailers Have Done
and
What Trailers Will Do

SEE THE ROGERS COMPLETE LINE

1000 Pounds to Ten Ton
2-Wheel, 4-Wheel
Semi-Dump, Logging

Write for Catalogue J

ROGERS BROTHERS CO.
ALBION PENNA.

Replacement Springs offering Bigger Profits for Dealers



for all makes of Cars

Only the finest carbon or alloy steel used. These are scientifically heat-treated and tempered in oil. Results in utmost resiliency combined with endurance. Made with or without center bolts.

15,000 Springs Always in Stock

Instant delivery, no matter what make of car. Every spring bears our long-time guarantee of satisfaction or money back quick. For faster service and bigger profits sell Maremont Springs.

Write today for our Catalogue and extraordinary offer

Maremont Mfg. Co.

916-918 S. Wabash Ave., Chicago
534-538 West 58th St. New York

CHAMPION



DROP FORGINGS

Keen competition demands the best quality. If drop forgings enter into the construction of your products, it will pay you to use the best, in other words—

CHAMPION DROP FORGINGS

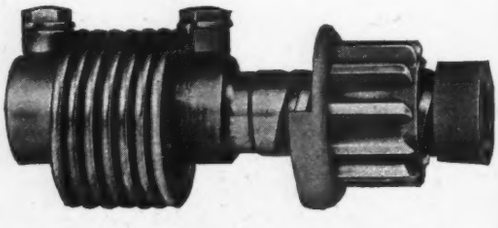
The Champion Machine & Forge Co.
CLEVELAND, OHIO

Berling
WORTH MORE
Magneto
DOES MORE

ERICSSON MFG. CO.
BUFFALO, N. Y.

ECLIPSE
BENDIX DRIVE

FOR ELECTRIC STARTERS
Automatic Engaging & Disengaging



194 motor car and truck builders use it

Made by
ECLIPSE MACHINE CO.
ELMIRA, NEW YORK

SPECIFY
Fahrig Metal

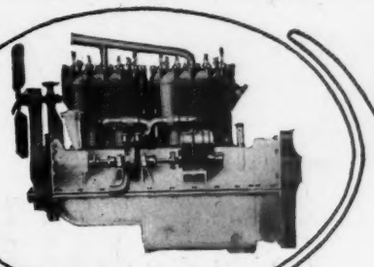


The Best Bearing Metal on the Market

A special process tin base, copper-hardened alloy for crankpin and crankshaft bearings. Uniform and homogeneous. Used like a regular babbitt metal, but has superior anti-friction qualities and great durability.

The only one we make. The only ones that make it.

FAHRIG METAL COMPANY
34 COMMERCE STREET, NEW YORK



Wisconsin
CONSISTENT

Fulfills All Its Promises

Wisconsin Motors leave the shops ready to run. They save money for the dealer by eliminating service costs and assure the owner of consistent, dependable power service.

Truck, tractor or passenger car builders specifying the Wisconsin know that the name "Wisconsin" certifies to the highest standards of engineering practice.

Each Wisconsin Motor is tested for power with an electric dynamometer—it must "deliver the goods" before our inspectors will pass it.

Slightly higher priced, of course, but in the end an economy all around.

Shall we send you the illustrated booklet: "Honors Wisconsin Has Won"?

WISCONSIN MOTOR MFG. COMPANY
Station A, Dept. 320 Milwaukee, Wisconsin

DISTRIBUTORS:

NEW YORK BRANCH: T. M. Fenner, Factory Representative
21 Park Row, New York, N. Y.

CALIFORNIA DISTRIBUTOR: Earl P. Cooper Company
Los Angeles, Cal.

NORTHWEST DISTRIBUTOR:
Chandler-Dunlap Company
Seattle, Wash.

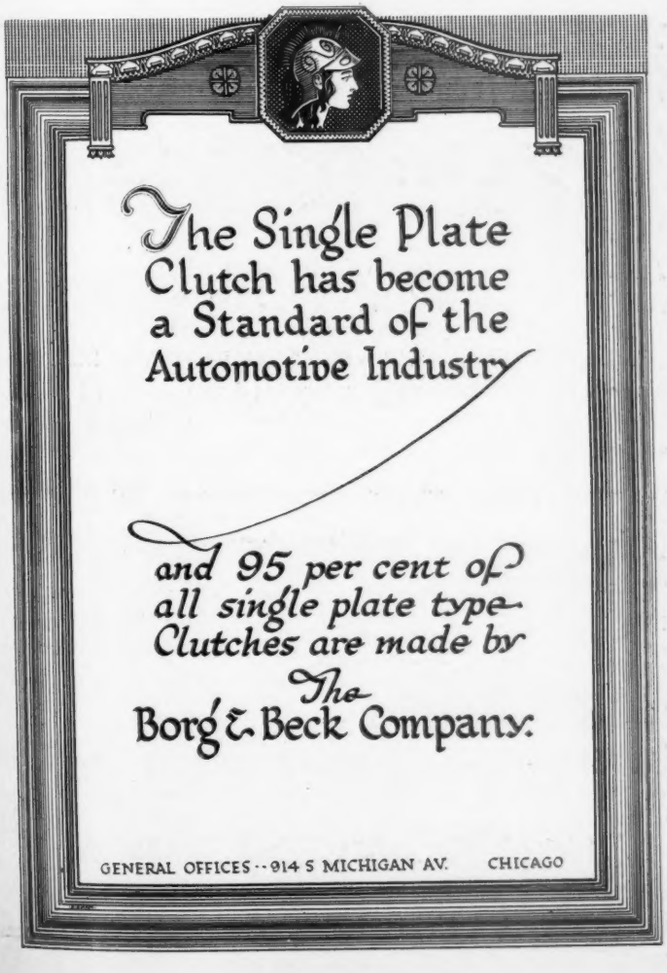
DENBY
MOTOR TRUCKS

IN those kinds of hauling where roads and loads and weather conspire to destroy a truck in its very prime, Denby lasts and *lasts* and *LASTS!*

Denby Motor Truck Co.
Detroit, Mich.



DENBY MOTOR TRUCK CO
DETROIT, MICHIGAN









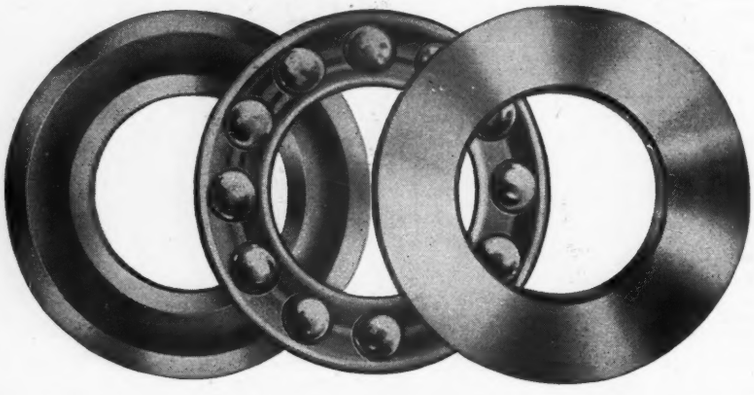
Sizes—1½" to3¼"
Prices—$4.50 to $6.00

PETRY CUT OUT

The last word in muffler Cut-Outs, because of its efficiency, its ease of application and its meritorious features. Expels the full exhaust to the rear, not down. Does not splatter mud and stir up dust. Has adjustable lever, making attaching easy; positive cut-off from the muffler. Spring away from heat and easily adjustable; compound lever action and spring makes action smooth and easy on pedal. Valve seat and valve machined to prevent leakage. A scientifically-designed mechanical job. Neat in appearance, strong in construction, thoroughly serviceable. Size plainly cast on each size. Invaluable for "tuning up" the motor.

N. A. Petry Company, Inc. 1319 Race St., Philadelphia

DISTRIBUTORS: Gray-Heath Co., 1440 Michigan Ave., Chicago, Ill.
Norman Cowan Co., 445-51 Rialto Bldg., San Francisco, Cal.
J. W. VanDeGrift, 627 Charles Bldg., Denver, Col.



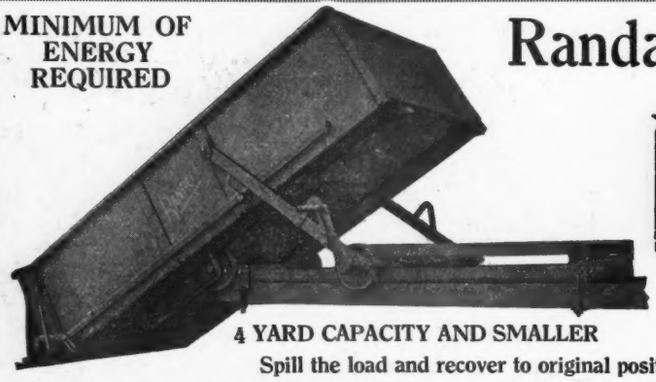
We do not stock or list Ball Thrust Bearings but build them to the requirements of the user.

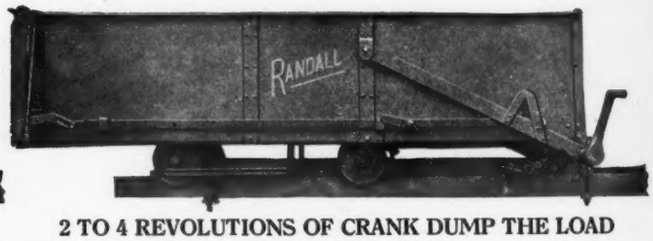
Let us quote on your bearing requirements and duplications of the Thrust Bearings you are now using.

THE BEARINGS CO. OF AMERICA
Lancaster Penna.
Western Sales Office, 1012 Ford Bldg., Detroit, Mich.

MINIMUM OF ENERGY REQUIRED

Randall Steel Dumping Bodies





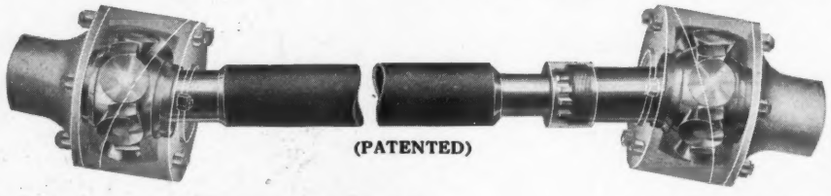
4 YARD CAPACITY AND SMALLER 2 TO 4 REVOLUTIONS OF CRANK DUMP THE LOAD

Spill the load and recover to original position in less time than any other dumping device

Randall Steel Dumping Bodies Company Sales Dept., 814 Hearst Bldg. Chicago, Ill.

REAM UNIVERSAL JOINTS

Ball and socket and full roller bearing
Oscillation impossible.
No backlash.
Do not develop velocity variation.
No damage through the agency of end-thrust.
Spline end extends through the ball, providing equal pressure on inner and outer end of ball.
All traces of whip are entirely removed.



(PATENTED)

No loss of power to deflect.
Perfect relative alignment under all conditions.
No noise—roller bearing.

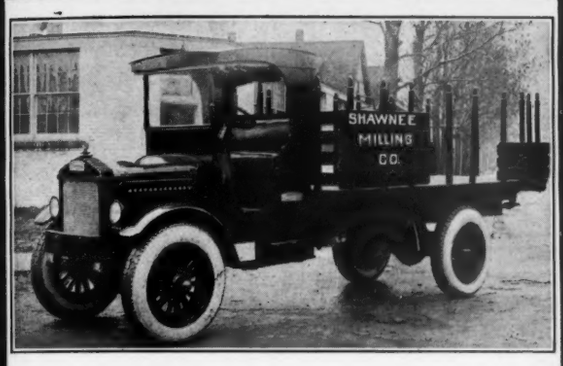
Positively does not waste lubrication.
Extraordinary long life.
Made entirely from forgings and bar stock.
Unequaled and unqualified service.
Repair shops, dealers, jobbers—ask us about replacement assemblies for any truck or car—all sizes.
Quantity production for manufacturers.
Send for catalog—contains complete detail.

R. S. Manufacturing Co., Kansas City, Missouri Plant and Works: Dayton, Ohio

THE HAND MADE TRUCK

KALAMAZOO

1½-2½-3½ Tons Capacity



An opportunity for distributors capable of handling a high-grade motor truck of proven merit.

Write for particulars covering territorial rights, etc.

Kalamazoo Motors Corporation
(MOTOR TRUCK DIVISION)
Kalamazoo, Mich. U. S. A.

STANWOOD
Whippet Tread

The GIANT CORD for PROFITABLE TRUCK OPERATION



Stanwood Rubber Co., Inc.
Executive Offices: 9 East 40th St., New York City
Chicago Branch: 1712 So. Michigan Ave.
Plant: Elizabeth, N. J.

DU PONT FABRIKOID
REG. U. S. PAT. OFF.

A beautiful, rugged weather-proof upholstery material for hard service on commercial vehicles.

Du Pont Fabrikoid Co.
Wilmington Delaware

Field
DURABLE BODIES

AN ENDURING INVESTMENT

In the good will of your customers—that's the truth about *every Field Body you sell.*

Field Durable Bodies are built to give *permanent satisfaction.* They possess great strength, with the lightest weight consistent with that strength.

Our manufacturing facilities are complete, and so large, that we produce Field Bodies at a price surprisingly low.

Our knockdown shipments secure lowest freight rates. A complete line of Ford Bodies always in stock.

Write for prices and full descriptions. Address Dept. Y.

FIELD MFG. CO., Dept. Y
Owosso, Michigan, U. S. A.





Tool Locked in Position for Removing or Replacing Tire

K. P. Universal Rim Tool

Price $3.50

The easiest way to remove tires from split rims

Fits all types of cross-cut demountable rims in use today.

Collapses a rim no matter how badly a tire may be stuck to it.

Forces the rim back on the tire again with the utmost ease—even in the case of new tires which are undersized.

Locks rim collapsed while tire is being removed or replaced.

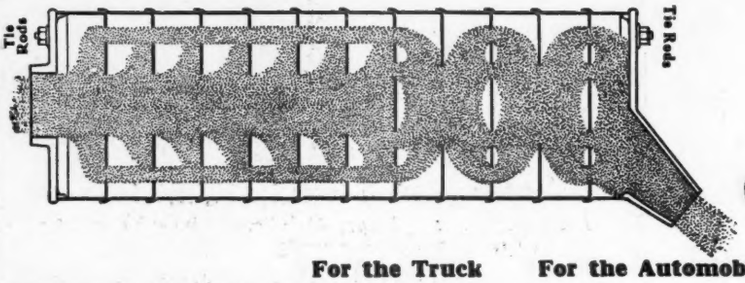
The K. P. Products Co., Inc.
250 West 54th St., New York

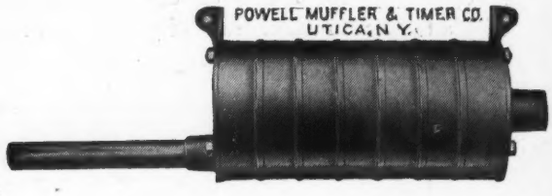
MAKERS OF—K. P. Foot-Rest Heater, K. P. Universal Rim Tool, K. P. Floatless Self-Feed Carburetor and Economy Governor.

Pacific Coast & Intermountain Representatives:
Norton-Munter Co., 1608 L. C. Smith Bldg., Seattle, Wash.

DEMAND Powell Pressed-Steel Mufflers

Won't Blow Up **No Loss of Power** **Won't Leak** **No Repairing**

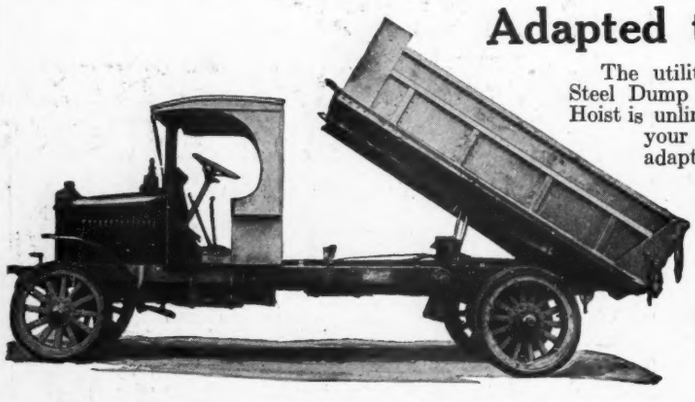




For the Truck **For the Automobile** **For the Ford**

POWELL MUFFLER & TIMER CO. **Utica, N. Y.**

Adapted to Every Need



The utility of Heil's 4-in-1 Combination Steel Dump Body equipped with a Hydro Hoist is unlimited. With this dumping unit your customer secures a dump body adapted for handling coal, gravel, brick, lumber, pipe, cement blocks, etc., without sacrificing one foot of loading space.

Quality TANKS BODIES & HOISTS "Made by Heil"

Write for circular 110—giving a complete description of Hydro Dumping Equipment

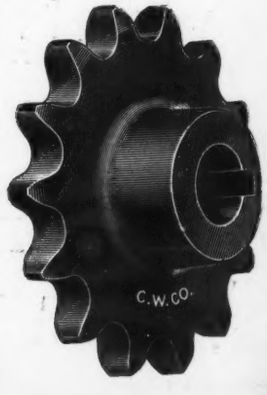
THE HEIL CO. Milwaukee, Wisconsin
Offices: 1143 Montana Ave.

Branches: Chicago Detroit New York St. Paul

CULLMAN SPROCKETS

in stock and to order





For Block, Roller and High Speed Silent Chains
New Catalog

Cullman Wheel Co., 1351 Altgeld St., Chicago

In UNION
There is Strength



The Swan Creek Lumber and Supply Co., Toledo, Ohio, have purchased four 2½ Ton Union Motor Trucks since last March.

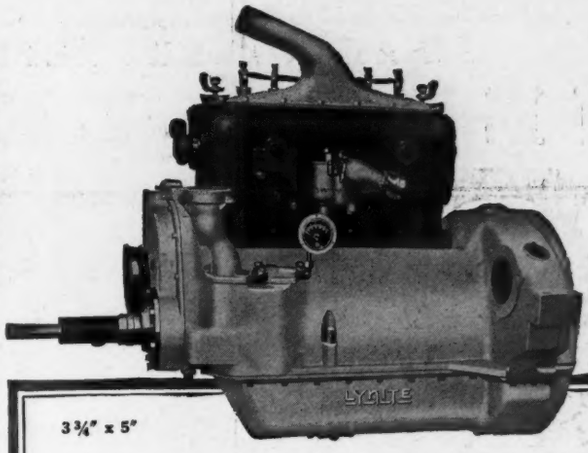
This is just one example of the large repeat order business Union Dealers are enjoying.

Build a profitable, permanent business for yourself with the Union Truck agency.

IS YOUR TERRITORY OPEN?

UNION MOTOR TRUCKS

UNION MOTOR TRUCK COMPANY
BAY CITY MICHIGAN



3¾" x 5"

For Those Who Seek the Best

Unstinted praise for its power is backed by keen admiration for its responsiveness, flexibility and easy starting.

Naturally, a motor of such quality attracts only those who seek the best.

Bore, 3¾"; stroke, 5". The power "graph" tells a story of genuine interest. Sent on request.

GOLDEN, BELKNAP & SWARTZ CO.
DETROIT, U. S. A.
Export Address: 100 Broad Street, New York
LONDON — PARIS

G·B&S motors

HESSE
THE WORLD'S BEST
TRAILER

Reversible Trailers
Pipe and Pole Trailers
Semi-Trailers

CAPACITIES:
800 pounds to 5 tons

ANY STYLE BODY DESIRED CAN BE FURNISHED

Prompt Deliveries

Write for Dealers' Contract

The Wm. G. Hesse & Son Mfg. Company
Leavenworth Kansas

C. J. P. LUCAS Buenos Aires
South American Representative

Jackson

FOUR WHEEL DRIVE TRUCKS

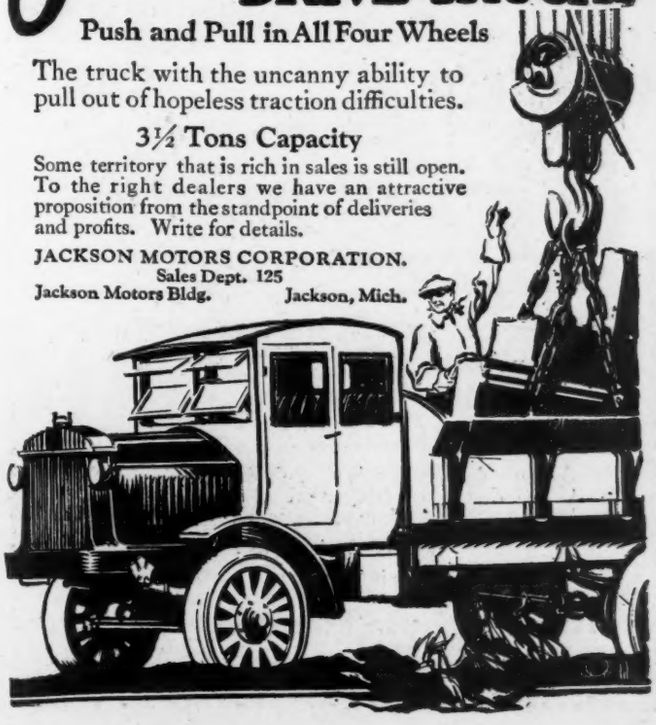
Push and Pull in All Four Wheels

The truck with the uncanny ability to pull out of hopeless traction difficulties.

3½ Tons Capacity

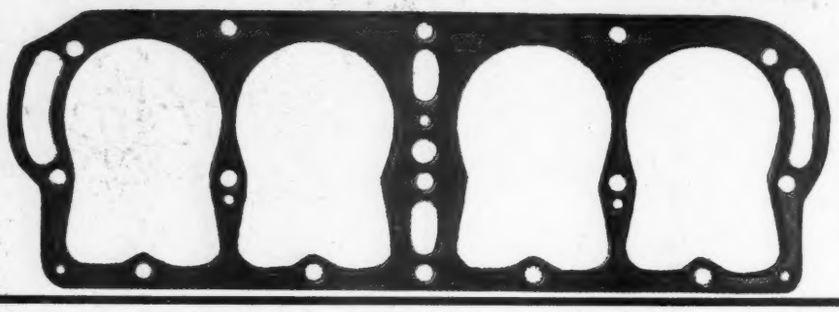
Some territory that is rich in sales is still open. To the right dealers we have an attractive proposition from the standpoint of deliveries and profits. Write for details.

JACKSON MOTORS CORPORATION.
Sales Dept. 125
Jackson Motors Bldg. Jackson, Mich.



ON ALL GASKET REPLACEMENT JOBS USE

NEVER-LEAK CYLINDER-HEAD GASKETS



Not only are they the best and tightest but they cost less than other good gaskets. There's a Never-Leak gasket for every size and make of truck and passenger car. See that your stock is complete, for service stations report a continued demand for them.

The Fitzgerald Mfg. Co.
Torrington Conn.

WOOD HYDRAULIC HOIST AND BODY COMPANY

Manufacturers of

Wood Hydraulic Hoists and Steel Dumping Bodies

CHICAGO DETROIT NEW YORK



F-300

FITZ-ER CABS

Are Built to a Standard by Cab Specialists

FOR ALL TRUCKS

A comprehensive service is embodied in FITZ-ER CABS that has readily received the approval of leading motor truck manufacturers.

"Just ask the driver"

Write for complete information.

FitzJohn-Erwin Manufacturing Co.
Muskegon Michigan

Olson Two-Ton Unit AND Olson Frame and Spring Equipments

for the Ford Ton Truck

The 2 Ton Unit consists of Olson drive shaft (replacing original Ford shaft) giving 142-in. wheelbase; 5-in. steel frame 9 ft. long; steel wheels, 32 x 3½ dual solid tires (or pneumatics if desired); 14 leaf 2¼ x 52-in. alloy steel side springs; **patented internal gear drive.**

Frame and Spring Equipment No. 8—5-in. channel pressed steel frame 8 ft. long, 10 leaf 2¼ x 52-in. side springs. Mounts 10 ft. body.

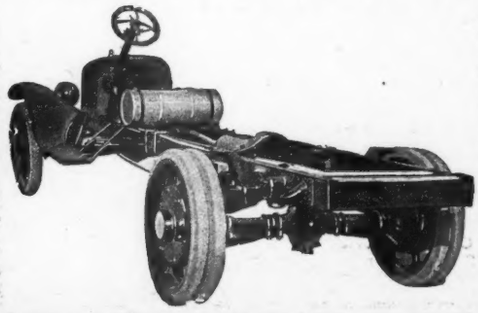
Equipment No. 9—OLSON drive shaft increasing wheelbase to 142 in.; 9 ft. frame. 10 leaf 2¼ x 52-in. side springs. Mounts 12 ft. body.

Equipment No. 10—Frame 11½ ft. long, wheelbase 172 in., mounts body up to 14 ft. long.

OLSON TWO-TON UNIT COMPLETE	$650.00 List
FRAME and SPRING EQUIPMENT No. 8	$150.00 List
FRAME and SPRING EQUIPMENT No. 9	$200.00 List
FRAME and SPRING EQUIPMENT No. 10	$250.00 List

Write for Dealers' Proposition

SWEDISH CRUCIBLE STEEL CO., Detroit, Mich.



OLSON 2 TON CHASSIS, wheelbase 142" or longer if required. Mounts bodies 6 ft. wide and up to 15 ft. long. Combination Ford Worm drive and Olson Patented Internal Gear Drive. Load weight carried direct to wheels by means of Olson patented spring suspension.



Cuts a Day's Work Down to 20 Minutes

Model "B" Hudson

Crankshaft Repair Arm

without dismantling the Ford motor

Fits both sides of all Ford Passenger Cars and Ford Trucks with or without starter. Simply loosen four bolts—slip arm in place—tighten nuts. That's all!

List Price $1.50
West of Rockies $1.75
Canadian List Price $2.50

Liberal trade discounts
Carried by 25,000 dealers

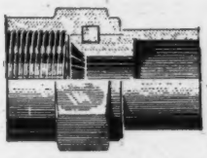


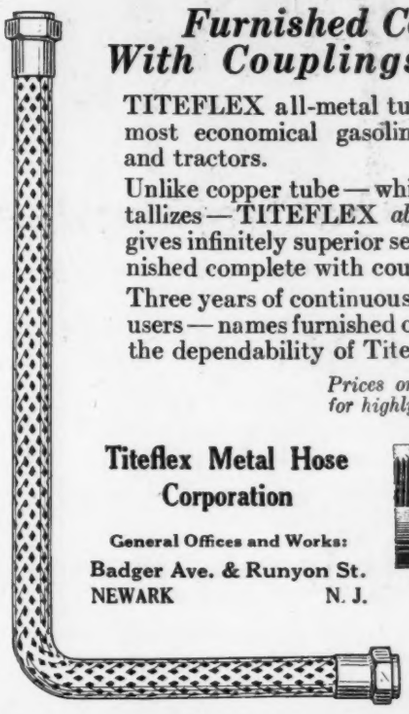
Hudson Motor Specialties Company
1932 Arch St.
Phila., Pa.

economical

Titeflex

All-Metal Gasoline Lines


Straight swivel coupling



Furnished Complete With Couplings Attached

TITEFLEX all-metal tubing furnishes the most economical gasoline line for trucks and tractors.

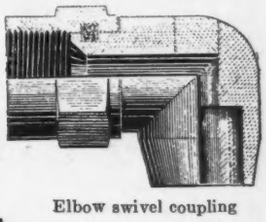
Unlike copper tube — which vibration crystallizes — TITEFLEX *absorbs* vibration, gives infinitely superior service — and is furnished complete with couplings attached.

Three years of continuous service by satisfied users — names furnished on request — prove the dependability of Titeflex.

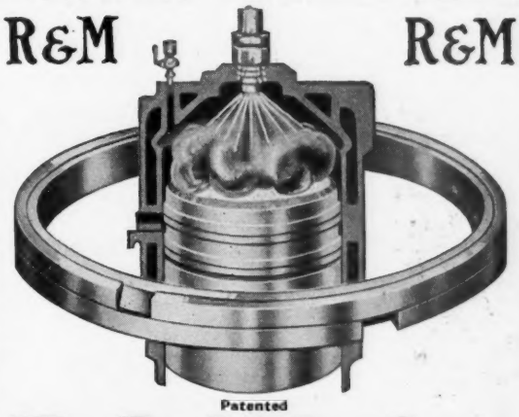
Prices on application — Write for highly informative literature

Titeflex Metal Hose Corporation

General Offices and Works:
Badger Ave. & Runyon St.
NEWARK N. J.


Elbow swivel coupling

R&M R&M



Patented

The R&M Conform Piston Ring

gets more power to the wheels because it gets full duty from the gas explosion in the combustion chamber. The three-piece construction and tight even radial pressure of R & M Rings leave absolutely no leaks.

MODERN ELECTRIC & MACHINE CO.
936-40 Fort Wayne Ave.
Indianapolis, Ind., U. S. A.

R&M CONFORM

MOSSBERG

ALL STEEL WRENCHES AND TOOLS

Leadership in the manufacture of tool equipment has been gained and maintained through adherence to principles of manufacture which insure to the user of Mossberg products the utmost in value and service.

Illustrated here are: No. 19 Socket Wrench Set; 6-inch and 12-inch All-Steel Socket Wrenches and All-Steel Speed Brace.



FRANK MOSSBERG CO.

WRENCHSMITHS FOR 20 YEARS

ATTLEBORO. MASS. U.S.A.

Its Use is Proof of Quality



Standard Worm Drive Axles embody new features of strength and correct engineering design that make them Standard Equipment on motor trucks built for quality.

Chicago Standard Axle Co.

1801-09 BELMONT AVENUE
CHICAGO, ILL.

LYNITE

ALUMINUM MANUFACTURES, INC.
General Office: Cleveland, Ohio
District Sales Offices: New York, Cleveland, Detroit, Chicago



Peerless Hoist, Showing Body Hitch
Worm and Gear, Machine Cut
We Furnish Body Hitch

The Only Logical Choice for Dealers

There is every reason why the Peerless is the logical hoist for you to sell. The discount is so liberal that your time is well paid for and a handsome profit is earned on every sale. The price appeals to your customers, as it is from one-third to one-half lower than the cost of other hoists.

But profit and price would make little appeal if you did not conscientiously believe that the

Peerless Hand Hoist

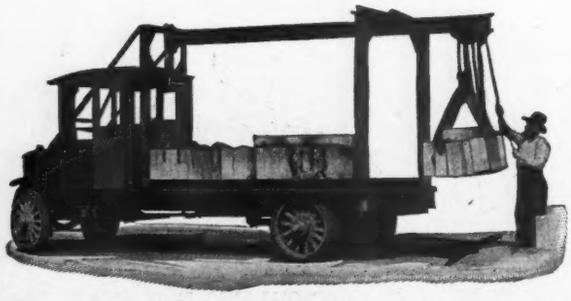
was superior in mechanical perfection and operation to any other lifting apparatus made. Rest content! It is *the only* efficient hoist that can be attached to either steel or wood bodies It is *the only* efficient hand hoist that sells at a moderate price. These are pretty strong reasons why you should consider its sales possibilities. An operator can hoist from one to four tons in from one to four minutes. What more could be required on speed!

You are getting calls for hoists and are often undecided as to *which* hoist to recommend. We'll tell you *why* the Peerless fills the bill every time. Will you let us?

Alsteel Bodies Guaranteed to Take Care of 100% Overload Under Rough Usage

The Auglaize Motor Car Company
New Bremen, Ohio

"Cuts Haulage Expense in Half"



One man can handle any material weighing up to five tons, easily and quickly

The Hendrickson Truck Crane

(Patented)

This crane is made to fit any motor truck. The structural steel supports are mounted on the truck frame and the I-beam, on which the trolley hoist travels, can be leveled when car stands on a grade. This adjustment is made by turning the handle on the screw device at front end of the beam. Full instructions for mounting are furnished with each order, and any mechanic can do the work in two or three hours. Dealers are supplied with literature, prices and discounts upon request.

Manufactured by

Hendrickson Truck Crane Co.

Peoples Gas Bldg. *Chicago, Ill.*

NOTICE!

Increase in Subscription Prices of CHILTON PUBLICATIONS

IN accordance with its policy of giving subscribers the utmost value for their money, the Chilton Company has deferred increasing the subscription price of its various publications until it was almost alone among trade publishers in maintaining old prices.

Even when postal rates were zoned, making tremendous increases in the cost of mailing a very considerable portion of our circulation, the old prices were maintained. And this, in spite of the fact that the postage cost on many copies was in excess of the amount received from the subscribers.

Rising costs have now made a change necessary. Since the present prices were established, paper alone has advanced over 300%, labor 100%, and everything entering into the production has steadily gone up in price so that we are now forced to announce the following subscription prices:

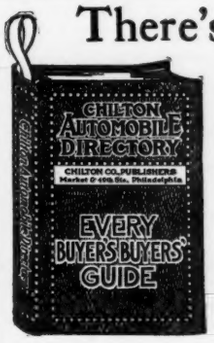
Automobile Trade Journal,	commencing	May 1st,	$2.00 per year
Commercial Car Journal,	"	May 1st,	2.00 " "
Chilton Tractor Journal,	"	July 1st,	2.00 " "
Chilton Automobile Directory,	"	January issue,	5.00 per copy
Chilton Tractor Index,	"	July issue,	2.00 " "

Subscriptions for the three JOURNALS will be taken at the present rate of $1.00 for one year until the above-mentioned dates. The January issue of the Chilton Tractor Index will be sold at $1.00 per copy until the edition is exhausted. It is an opportunity to get the biggest and best buy in the automobile truck and tractor trade paper fields. At the NEW prices the value will be unrivalled; at the OLD it is a value so surprising as to induce immediate action in subscribing.

Send money order, check or currency

CHILTON COMPANY
Subscription Department
Market and 49th Streets
Philadelphia Pennsylvania

There's no excuse



for using an old copy of

CHILTON AUTOMOBILE DIRECTORY
(Published quarterly)

when you can get the latest edition for only

$5.00

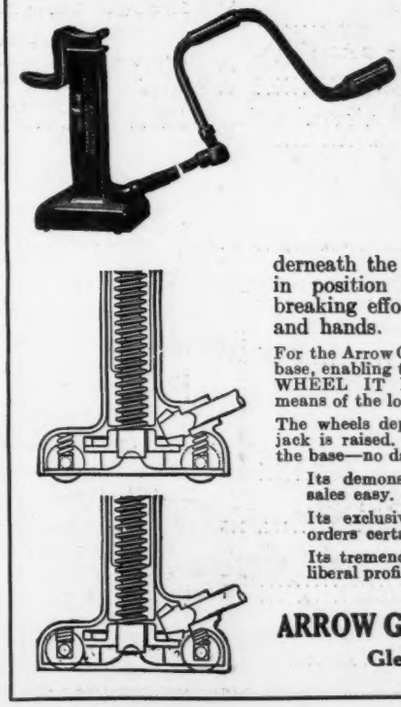
If your time is valuable, this DIRECTORY will prove useful; for the information you seek is instantly available. Over 1200 headings are employed in listing every known manufacturer of cars, trucks, parts, accessories, tools and machinery, materials and supplies pertaining to the automobile industry.

If you have an old copy, better send currency, money order or check, today, for the latest edition.

Chilton Company, Publishers
Market and 49th Streets, Philadelphia, Pa.

ARROW GRIP
NON-SKID CHAINS FOR SOLID TIRE VEHICLES
Reg. U. S. Pat. Off.

ROLLER BASE JACK



The Jack that *Wheels* Under the Car and is *Handle-Controlled*

The Arrow Grip Jack overcomes the car owner's chief objection to old-style jacks — the necessity of climbing underneath the car to adjust the jack in position with consequent back-breaking effort and soiling of clothes and hands.

For the Arrow Grip Jack operates on a roller base, enabling the operator to ACTUALLY WHEEL IT BENEATH THE CAR by means of the long extension handle.

The wheels depress into the base and the jack is raised. The weight is balanced in the base—no danger of toppling over.

Its demonstrable superiority makes sales easy.

Its exclusive features make repeat orders certain.

Its tremendous sales appeal assures liberal profits.

ARROW GRIP MFG. CO., INC.
Glens Falls, N. Y.

BUYERS' INDEX

This is NOT an index of what manufacturers make, but merely an index of the CONTENTS of both the reading and advertising pages of THIS PARTICULAR ISSUE, and is placed here for the benefit and convenience of our readers

Air Brakes
Parker Appliance Co., Inc. 309

Air Compressors
Brunner Mfg. Co. 46
Hobart Bros. Co. 86
Kellogg Mfg. Co. 331

Aluminum Castings
Precision Castings Co., Inc. 308

Aluminum Ware
Foster, Merriam & Co. 208

Ammeters & Voltmeters
Roller-Smith Co. 86

Anti-Skid & Traction Devices
American Business Corporation 213
Challoner Co. 206
Foley Traction Rim Co., Inc. 288

Anti-Squeak Webbing
Hide, Leather & Belting Co. 205

Arbor Presses
Lipe, R. M. 44

Asbestos Yarn & Cloth
General Asbestos & Rubber Co. 279

Axles
Adams Axle Co. 306
American Machine Co. 218
Chicago Standard Axle Co. 320
Clark Equipment Co. 93
Columbia Axle Co. 235
Hero Manufacturing Co. 8
Russel Motor Axle Co. ...Inside Back Cover
Savage Arms Corporation 216
Sheldon Axle & Spring Co. 262
Standard Parts Co. 155
Timken-Detroit Axle Co. 233
Torbensen Axle Co. 153
Wisconsin Parts Co. 122

Axle Housings
Bossert Corporation, The (Pressed Steel) 6
Hydraulic Pressed Steel Co. 150

Axle Stands & Axle Attachments
Weaver Mfg. Co. 44

Ball Bearings
Bantam Ball Bearing Co. 309
Bearings Co. of America 314
Fafnir Bearing Co. 304
Federal Bearings Co., Inc. 302
Marlin-Rockwell Corporation 181
New Departure Mfg. Co. 283
Norma Co. of America 277
S K F Industries, Incorporated 105

Balls, Brass & Steel
Hoover Steel Ball Co. 99
S K F Industries, Incorporated 105

Battery Charging Outfits
France Mfg. Co. 83
Westinghouse Electric & Mfg. Co. 44

Batteries, Storage & Parts
Electric Storage Battery Co. 245

Battery Boxes
A. B. & B. Sheet Metal Works 278

Battery Ignition Systems
Westinghouse Electric & Mfg. Co. 207

Bearings & Bushings
Bantam Ball Bearing Co. 309
Bearings Co. of America 314
Bound Brook Oil-less Bearing Co. 276
Cramp, Wm. & Sons, S. & E. Bldg. Co. . 297
Doehler Die-Castings Co. 305
Federal Bearings Co., Inc. 302
Norma Co. of America (Thrust) 277
Precision Castings Co., Inc. 308

Bearing Metal
Cramp, Wm. & Sons, S. & E. Bldg. Co. . 297
Fahrig Metal Co. 312

Bearing Service
Bearings Service Co. 174, 175

Bodies
Archer Iron Works 277
Auglaise Motor Car Co. 320
Auto Truck Steel Body Co. 300
Babcock, H. H. Co. 291
Columbia Wagon Co. 284
Columbian Steel Tank Co. 196
Field Mfg. Co. 315
Heil Co. 316
Highland Body Manufacturing Co. 286
Kilbourne & Jacobs Mfg. Co. 131, 132
Lee Loader & Body Co. 282
Mansfield Steel Corporation 307
Martin-Parry Corporation 167
Metropolitan Body Co. 299
Randall Steel Dumping Bodies Co. 314
Simplex Mfg. Co. 295
Spaulding Mfg. Co. 65
Wood Hydraulic Hoist & Body Co. 318

Brake Drums
Hydraulic Pressed Steel Co. 150

Brake Lining
Belt & Web Co. 83
General Asbestos & Rubber Co. 279
Johns-Mansville, H. W. Co. 272, 273
Multibestos Co. 170, 171
Russell Manufacturing Co. 228
Staybestos Manufacturing Co. 311
Thermoid Rubber Co. 161, 261

Brass & Bronze Bars (Cored and Solid)
Cramp, Wm. & Sons, S. & E. Bldg. Co. . 297

Bronze & Brass Castings
Cramp, Wm. & Sons, S. & E. Bldg. Co. . 297
Doehler Die-Castings Co. 305

Cable (Ignition, Starting & Lighting)
Packard Electric Co. 281

Cabs
Brummler Ruggles Metal Products Co. .. 65
Fitz John-Edwin Manufacturing Co. 318
Highland Body Mfg. Co. 286

Camshafts
Muskegon Motor Specialties Co. 313

Carburetors & Outfits
Economy Carburetor Co. 86
K. P. Products Co., Inc. 316
Stromberg Motor Devices Co. 166
Van Briggle Motor Device Co. 267
Zenith Carburetor Co. 177

Casters
Foster, Merriam & Co. 208

Castings
(See Aluminum, Bronze & Brass, Iron Castings, Die Castings, Malleable & Steel Castings)

Cement
Johns-Manville, H. W. Co. 272, 273
Portland Cement Association 147

Chains
Baldwin Chain & Manufacturing Co. ... 210
Cullman Wheel Co. 316

Chain Blocks
Ford Chain Block & Mfg. Co. 301

Chucks
S K F Industries, Incorporated 105

Cleaning Compounds
Oakley Chemical Co. 289

Clutches
Borg & Beck Co. 313
Covert Gear Co., Inc. 115
Detlaff, A. J., Co. 128
Fuller & Sons Mfg. Co. 121
Hartford Automotive Parts Co. 295
Merchant & Evans Co. 290
Warner Gear Co. 223

Clutch Facings
General Asbestos & Rubber Co. 279
Russell Manufacturing Co. 228

Clutch Parts
Curtis Saw Co. 303

Cocks
Michigan Lubricator Co. (Air, Drain & Gasoline) 236

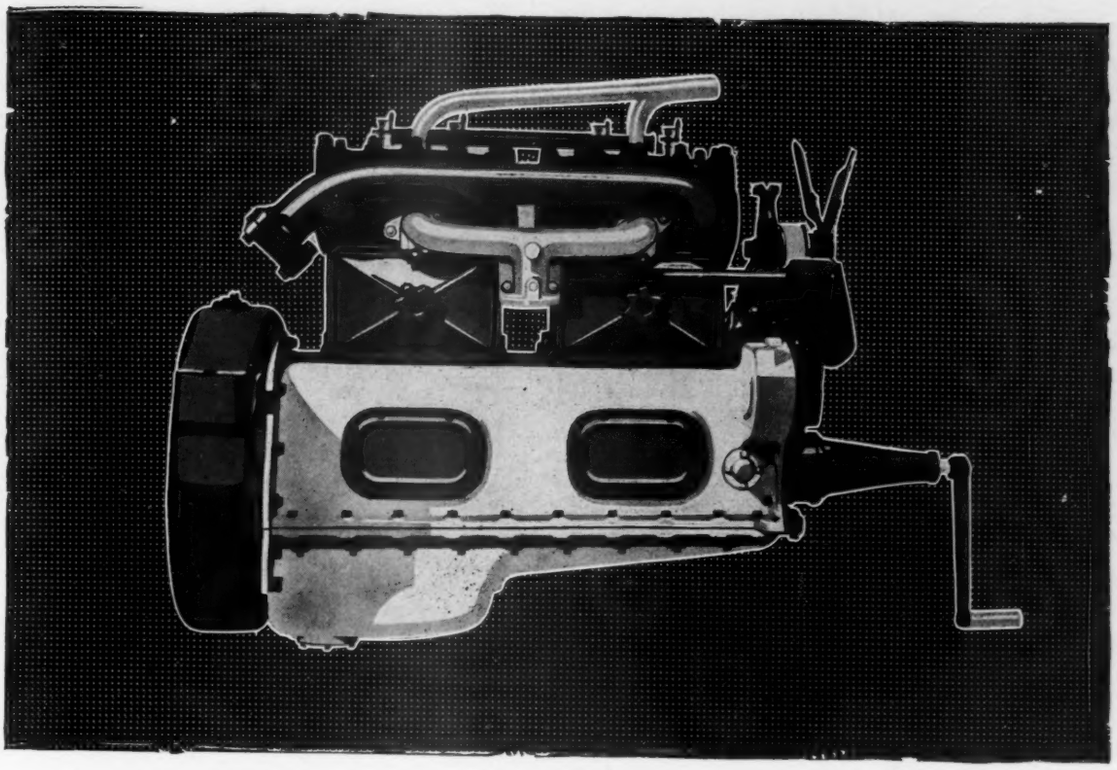
Commercial Cars (Electric)
Oneida Motor Truck Co. 136

Commercial Cars (Gasoline)
Ace Motor Trucks 178, 179
Acme Motor Truck Co. 183
American Commercial Car Co. 293
American Motor Truck Co. 178, 179
Armleder, O., Co. 254, 255
Atterbury Motor Car Co. 91
Autocar Co. 16
Available Truck Co. 149
Bessemer Motor Truck Co. 138
Bethlehem Motors Corp. 266
Carrier Motor Truck Co. 309
Clydesdale Motor Truck Co. 141
Columbia Motor Truck & Trailer Co. ... 265
Dart Truck & Tractor Corp. 332
Day-Elder Motors Corporation 241
Defiance Motor Truck Co. 4
Denby Motor Truck Co. 313
Dependable Truck & Tractor Co. 290
Diamond T Motor Car Co. 202
Duplex Truck Co. 201
Federal Motor Truck Co. 156
Forschler Motor Truck Mfg. Co. 193
Garford 107
Gary Motor Truck Co. 299
General Motors Truck Co. 142
Graham Brothers 308
Gramm-Bernstein Motor Truck Co. 227
Grant Motor Car Corporation 303
Hamilton Motors Co. 111
Hawkeye Truck Co. 191
Hebb Motors Co. 257
Huffman Brothers Motor Co. 186
Hurlburt Motors, Inc. 327
Independent Motor Truck Co., Inc. 114
International Harvester Co. of America, Inc. 222
International Motor Co. 209
Jackson Motors Corporation 317
Kalamazoo Motors Corporation 70, 315
Kentucky Wagon Mfg. Co., Inc. 230
Keystone Motor Truck Corporation 256
Kissel Motor Car Co. 135
Koehler, H. J. Motors Corp. 185
Larrabee-Deyo Motor Truck Co., Inc. ... 294
Lewis-Hall Iron Works 160
Luedinghaus Wagon Co. 281
Maccar Truck Co. 165
Martin-Parry Corporation 123
Master Trucks, Inc. 169
Maxwell 151
Mutual Truck Co. 300
Napoleon Motors Co. 144
Nash Motors Co. 263
Nelson Motor Truck Co. 119
Noble Motor Corporation 296
Oneida Motor Truck Co. 136
Oshkosh Motor Truck Mfg. Co. 298
Paige-Detroit Motor Car Co. 120
Parker Motor Truck Co. 162
Pierce-Arrow Motor Car Co. 152
Rainier Motor Corporation 329
Republic Motor Truck Co., Inc. .Front Cover
Rowe Motor Mfg. Co. 238
Sanford Motor Truck Co. 306
Schacht, G. A., Motor Truck Co. 220
Selden Truck Corporation 13, 62
Service Motor Truck Co. 146
Signal Motor Truck Co. 247
Standard Motor Truck Co. 251
Stewart Motor Corp. .....Back Cover
Stoughton Wagon Co. 285
Sullivan Motor Truck Corporation 301
Tiffin Wagon Co. 225
Titan Truck Co. 69, 304
Tower Motor Truck Co. 310
Traffic Motor Truck Corporation 173
Transport Truck Co. 188, 189
Traylor Engineering & Mfg. Co. 68, 252
Union Motor Truck Co. 317
United States Motor Truck Co., Inc., 198, 199
Ward La France Truck Co., Inc. 66,307
Watson Products Corp. 248
Wilson, J. C., Co. 304
Winther Motor Truck Co. 302

Control Sets
Baker Gun & Forging Co. 294

Cotter Pins
American Chain Co., Inc. 45

Couplings (Magneto, Pump, Etc.)
Slocum, Avram & Slocum Laboratories .. 124



Waukesha
TRADE MARK

HIGH TORQUE MOTORS

(Maximum Pull at Usable Speed)

INSPIRE OWNER CONFIDENCE

Owners of trucks that are Waukesha powered have unbounded confidence in the ability of their equipment to function in a dependable, economical manner.

The high torque principle of construction, embodied in Waukesha Motors, has proven by unfailing performance to be correct.

Over the road or through plowed fields, Waukesha Motors maintain maximum pull at usable speed.

The result is unfailing service plus economy of operation and upkeep.

Keeping pace with the steadily increasing public demand for more efficient power plants, Waukesha Motors have experienced a steady and consistent growth in sales.

Automotive equipment manufacturers who specify Waukesha High Torque Motors in the tractor or truck they build, will, by inspiring owner confidence, assure the future of their product.

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS.

The World's Largest Builders of Tractor and Truck Motors Exclusively

BUYERS' INDEX—Continued

Cranes
Hendrickson Truck Crane Co. 320
Thomson Auto Specialties Co. 137

Crankshafts
Park Drop Forge Co. 291
Union Switch & Signal Co. 278
Wyman-Gordon Co. 5

Crankshaft Reamers
Lee, H. A., Tool & Mfg. Co. 43

Curb Outfits (Gasoline)
Bowser, S. F. & Co., Inc. 287

Current Rectifiers
France Mfg. Co. 83

Die Castings
Doehler Die-Castings Co. (Bronze-Back Babbitt Bearings) 305
Precision Castings Co., Inc. 308

Differentials
Brown-Lipe-Chapin Co. 197
Cleveland Worm Gear Co. 231
East Iron & Machine Co. 298
Forest City Machine & Forge Co. 212
New Process Gear Corp. 226
Powrlok Co. 239

Differentials (Positive Drive)
East Iron & Machine Co. 298
Forest City Machine & Forge Co. 212
Powrlok Co. 239

Electric Lighting Systems
(See Starting & Lighting Outfits)

Electric Testing Instruments
Niehoff, Paul G., & Co., Inc. 301

Engines
Buda Co. 103
Continental Motors Corporation 184
Golden, Belknap & Swartz Co. 317
Hercules Motor Mfg. Co. 270
Herschell-Spillman Motor Co. 159
Le Roi Co. 325
Light Mfg. & Foundry Co. 306
Lycoming Foundry & Machine Co. 192
Midwest Engine Co. 168
Minneapolis Steel & Machinery Co. 127
Waukesha Motor Co. 323
Weidely Motors Co. 303
Wisconsin Motor Mfg. Co. 313

Engine Case Repair Arms
Hudson Motor Specialties Co. 319

Equipment & Parts for Ford Cars
Broadway Tool & Machine Co., Inc. 84
Cornfield Wheel Co., Inc. 154
Economy Carburetor Co. 86
Field Mfg. Co. 315
General Asbestos & Rubber Co. 279
Hudson Motor Specialties Co. 319
Knight Metal Products Co. 84
Luverne Auto Co. 308
Mansfield Steel Corporation 307
Martin-Parry Corporation 167
Motors Metal Mfg. Co. 293
Motor Truck Radiator & Mfg. Co. 283
Multibestos Co. 170, 171
Powell Muffler & Timer Co. 316
Spaulding Mfg. Co. 65
Swedish Crucible Steel Co. 318
Van Briggle Motor Device Co. 267
Veeder Mfg. Co. 282

Fans
Oakes Co. 133

Fan Belts
Belt & Web Co. 83

Fenders
A. B. & B. Sheet Metal Works 278
Motors Metal Mfg. Co. 293

Fender Irons
Mansfield Steel Corporation 307

Ferro Alloys
Climax Molybdenum Co. 12

Fibre
Delaware Hard Fibre Co. 299
General Asbestos & Rubber Co. 279

Filters (Oil)
Bowser, S. F., & Co., Inc. 287

Financing Companies
National Guarantee Credit Corporation .. 129
Transportation Finance Co., Inc. 307

Fire Apparatus
Childs, O. J., Co. 195

Fire Extinguishers
American-La France Fire Engine Co., Inc. 83
Johns-Manville, H. W., Co. 272, 273

Fittings, Brass, Tank, Etc.
Bowen Products Corp. 279
Michigan Lubricator Co. 236

Flooring (Ventilating)
Irving Iron Works Co. 286

Forgings
Billings & Spencer Co. 221
Champion Machine & Forge Co. 312
Obenberger, John, Forge Co. 172
Park Drop Forge Co. 291
Union Switch & Signal Co. 278
Western Drop Forge Co. 242
Williams, J. H., & Co. 296
Wyman-Gordon Co. 5

Frames
Detroit Pressed Steel Co. 292
Hydraulic Pressed Steel Co. 150
Mansfield Steel Corporation 307
Parish & Bingham Corporation 249
Smith, A. O. Corporation 284

Gaskets
Fitzgerald Mfg. Co. 318
McCord Manufacturing Co., Inc. 200

Gasoline & Oil Storage Outfits
Bowser, S. F., & Co., Inc. 287
Geuder, Paeschke & Frey Co. 10
Janney, Steinmetz & Co. 311
Trageser, John Steam Copper Works ... 305

Gears & Gear Cutting
Brown-Lipe-Chapin Co. 197
Brown-Lipe Gear Co. 197
Cleveland Worm Gear Co. 231
Cotta Transmission Co. 140
Covert Gear Co., Inc. 115
Detroit Gear & Machine Co. 299
Durston Gear Corporation 148
East Iron & Machine Co. 298
Forest City Machine & Forge Co. 212
Fuller & Sons Mfg. Co. 121
Machine Products Co. 302
New Process Gear Corp. 226
Warner Gear Co. 223

Gear Cutting Machinery
Machine Products Co. 302

Governors (Engine)
K. P. Products Co., Inc. 316
Monarch Governor Co. 194
Pierce Governor Co. 143

Grease & Oil Cups & Guns
Bloom Flusher Co. 83
Bowen Products Corp. 88, 279
Coe-Stapley Mfg. Corp. 84
Madison-Kipp Corp. 232
Michigan Lubricator Co. 236

Heaters (Garage)
Masdon Mfg. Co. 88

Hoists
Archer Iron Works 277
Auglaize Motor Car Co. 320
Auto Truck Steel Body Co. 300
Century Hoist Mfg. Co. 45
Columbia Steel Tank Co. 196
Ford Chain Block & Mfg. Co. 301
Heil Co. 316
Horizontal Hydraulic Hoist Co. 303
Hydraulic Hoist Mfg. Co. 292
Kilbourne & Jacobs Mfg. Co. 131, 132
Mansfield Steel Corporation 307
Simplex Mfg. Co. 295
Wood Hydraulic Hoist & Body Co. 318

Hoods
A. B. & B. Sheet Metal Works 278
Motors Metal Mfg. Co. 293

Horns
Stewart-Warner Speedometer Corp. 264

Hose (Gasoline)
Metal Hose & Tubing Co., Inc. 307

Hub Flanges
Hydraulic Pressed Steel Co. 150

Hub Odometers
American Taximeter Co. 309
Johns-Mansville, H. W. Co. 272, 273
Veeder Mfg. Co. 282

Ignition Specialties
American Bosch Magneto Corp. 268, 269
Apollo Magneto Corp. 274
Eisemann Magneto Corporation 258, 259
Ericsson Mfg. Co. 312
Lauraine Magneto Co., Inc. 253
Packard Electric Co. 281
Splitdorf Electrical Co. 113
Teagle Co. 306
Westinghouse Electric & Mfg. Co. 207

Inner Tubes & Cases
Firestone Tire & Rubber 85

Iron Castings
Foster, Merriam & Co. 208

Jacks
Arrow Grip Mfg. Co., Inc. 321
Iron City Products Co. 203
Walker Mfg. Co. 219

Jigs (Riveting)
Continental Auto Parts Co. 46

Lamps
Dietz, R. E. Co. 243
Stewart-Warner Speedometer Corp. 264

Loading Equipment
Lee Loader & Body Co. 282

Lubricants
Sinclair Refining Co. 214, 215

Lubricators
McCord Manufacturing Co., Inc. 200
Madison-Kipp Corporation 232
Michigan Lubricator Co. 236

Machines
(See Tools, Machines, etc.)

Magnetos
American Bosch Magneto Corp. 268, 269
Apollo Magneto Corp. 274
Eisemann Magneto Corporation 258, 259
Ericsson Mfg. Co. 312
Lauraine Magneto Co., Inc. 253
Splitdorf Electrical Co. 113
Teagle Co. 306

Malleable Castings
American Malleable Castings Association, 246

Motors (Gasoline)
(See Engines, Gasoline)

Moulds & Outfits
Associated Electric Service Station 45

Mufflers & Cutouts
Petry, N. A., Co., Inc. 314
Powell Muffler & Timer Co. 316

Oils
(See Lubricants)

Oil Cups
(See Grease & Oil Cups)

Oil Adapters
Madison-Kipp Corporation 232

Oil Indicators
Michigan Lubricator Co. 236

Packings
Johns-Manville, H. W. Co. 272, 273

Pistons, Rings & Pins
Aluminum Manufactures, Inc. 320
American Hammered Piston Ring Co. .. 9
Foster, Merriam & Co. 208
Gill Mfg. Co. 190
Modern Electric & Machine Co. 319
Piston Ring Co. 204
Pressure Proof Piston-Ring Co. 298
Vapor-Tight Ring Co. 86

Piston Vises
Continental Auto Parts Co. 45

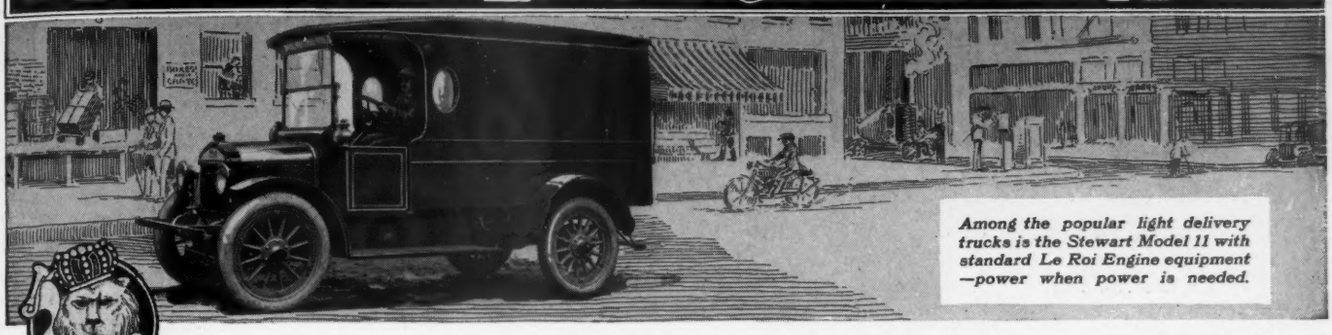
Power Take-offs
Knight Metal Products Co. 84

Presses
(See Arbor & Tire Presses)

Pressed Steel Frames
Detroit Pressed Steel Co. 292
Hydraulic Pressed Steel Co. 150
Parish & Bingham Corporation 249
Smith, A. O., Corporation 284

Pressed Steel Parts
Bossert Corporation, The 6
Hydraulic Pressed Steel Co. 150
Parish & Bingham Corporation 249

LE ROI the Little Giant of a Motor



Among the popular light delivery trucks is the Stewart Model 11 with standard Le Roi Engine equipment —power when power is needed.

Statistics show that fully 65% of all motor trucks are one-ton capacity or smaller. Such trucks must be all-purpose trucks. They keep the wheels of commerce moving. There can be no question about the power plant.

¶ LE ROI Motors are standard with several of America's foremost light truck builders. They have maintained their leadership in the face of tremendous competition. The combination of mechanical excellence, precision in production, absolute interchangeability of parts and prompt deliveries has won for us a valued list of customers.

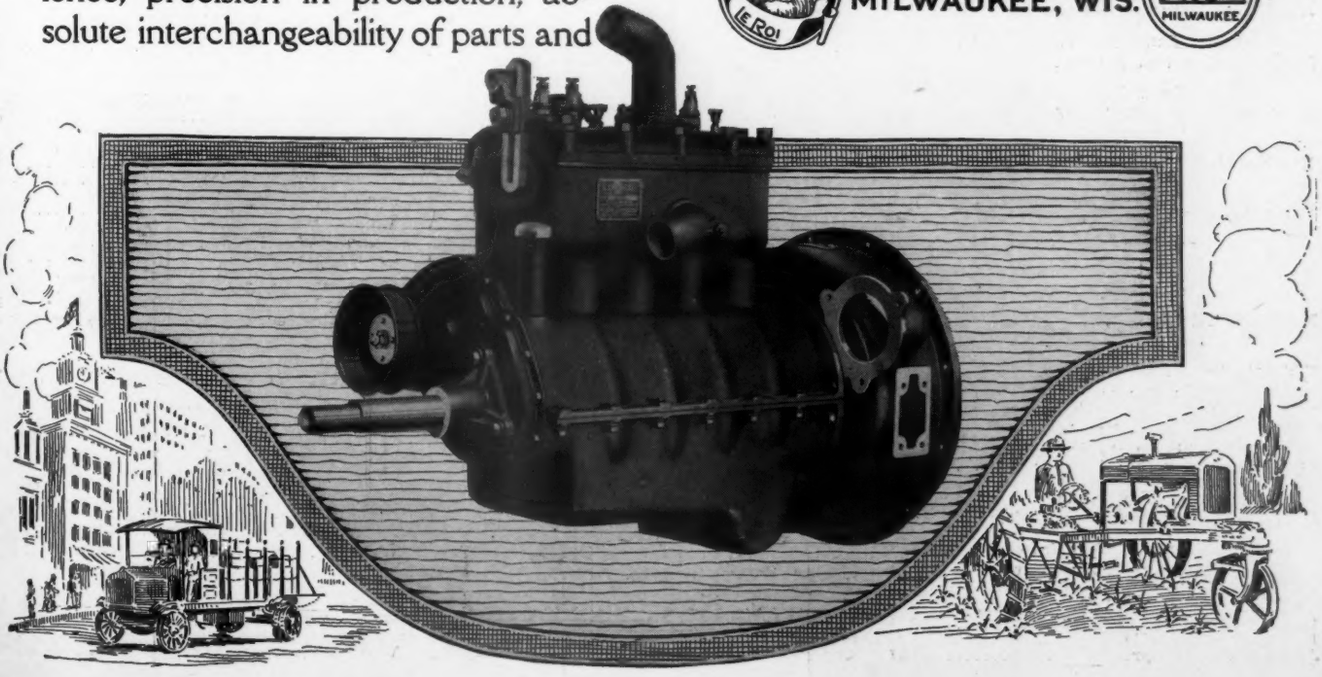
¶ Model 2C with $3\frac{1}{8}$" bore and $4\frac{1}{2}$" stroke is giving splendid service and satisfaction wherever it has been adopted.

¶ We welcome correspondence from all makers of motor trucks, passenger cars, power cultivators, and others who are constantly striving as we are to better our product.

LE ROI COMPANY

MITCHELL ST. AND 60 TH. AVE.
MILWAUKEE, WIS.

CABLE LE ROI MILWAUKEE



BUYERS' INDEX—Continued

Pressed Steel Tanks
Heil Co. 316
Janney, Steinmetz & Co. 311

Priming Cups
Michigan Lubricator Co. 236

Propeller Shafts
Spicer Mfg. Corporation 158

Pumps (Garage Tire)
(See Air Compressors & Pumps

Pumps (Gasoline & Oil)
Bowser, S. F., & Co., Inc. 287
Dearborn Engineering & Equipment Co.. 88

Pumps (Power Tire)
Kellogg Mfg. Co. 331

Radiators
G. & O. Manufacturing Co. 15
Hooven Radiator Co. 304
Long Manufacturing Co. 157
McCord Manufacturing Co., Inc. 200
Modine Mfg. Co. 285
Motor Truck Radiator & Mfg. Co. 283
Rome-Turney Radiator Co. 287

Radiator Compounds & Cements
"X" Laboratories 305

Radiator Fans
Oakes Co. 133

Radiator Guards
Irving Iron Works Co. 286
Mansfield Steel Corporation 307

Radiator Tubing
Dallas Brass & Copper Co. 280

Recording Devices
Johnston, Wm. R., Mfg. Co. 88

Rims
Foley Traction Rim Co. 288
Goodyear Tire & Rubber Co. 118

Rim Tools
K. P. Products Co., Inc. 316
Marquette Mfg. Co., Inc. 43

Roller Bearings
Bower Roller Bearing Co. 125
Hart Roller Bearing Co. 289
Hyatt Roller Bearing Co. 237
Marlin Rockwell Corporation 181
Norma Co. of America 277
Standard Parts Co. 155
Timken Roller Bearing Co. 211

Roofing (Asbestos)
Johns-Mansville, H. W. Co. 272, 273

Running Boards & Shields
A. B. & B. Sheet Metal Works 278
Hydraulic Pressed Steel Co. 150

Sediment Traps
Michigan Lubricator Co. 236

Sheet Metal Parts
A. B. & B. Sheet Metal Works 278

Shims
Laminated Shim Co. 297

Shock Absorbers
Van Briggle Motor Device Co. 267

Sight Feeds (Dash)
Michigan Lubricator Co. 236

Sod Pans
Motors Metal Mfg. Co. 293

Spark Plugs
Federal Corp. 86
Ford Mica Co., Inc. 88
Lockwood-Ash Motor Co. 217

Speedometers
Johns-Mansville, H. W. Co. 272, 273
Stewart-Warner Speedometer Corp. 264

Spotlights
Stewart-Warner Speedometer Corp. 264

Springs (Auxiliary)
(See Shock Absorbers)

Springs (Body)
Harvey Spring & Forging Co. 134
Iron City Spring Co. 302
Jenkins Vulcan Spring Co. 297
Maremont Mfg. Co. 311
Mather Spring Co. 234
Sheldon Axle & Spring Co. 262
Spring Perch Co. 7

Sprockets
Baldwin Chain & Manufacturing Co. ... 210
Cullman Wheel Co. 316
Hydraulic Pressed Steel Co. 150

Stampings
Hydraulic Pressed Steel Co. 150
Motors Metal Mfg. Co. 293

Starting & Lighting Outfits
Eclipse Machine Co. (Bendix Drive) ... 312

Steel
Climax Molybdenum Co. 12
Marlin-Rockwell Corporation 181

Steel Castings
Sivyer Steel Casting Co. 89

Steering Apparatus (Auto)
Lavine Gear Co. 11
Ross Gear & Tool Co. 87

Street Flushers
Tiffin Wagon Co. 225

Tanks (Air, Gasoline & Oil)
A. B. & B. Sheet Metal Works 278
Bowser, S. F., & Co., Inc. 287
Columbian Steel Tank Co. 196
Geuder, Paeschke & Frey Co. 10
Heil Co. 316
Janney, Steinmetz & Co. 311
Motors Metal Mfg. Co. 293
Trageser, John, Steam Copper Works ... 305

Tires
Edwards Rubber Co. 86
Firestone Tire & Rubber Co. 85
Fisk Rubber Co. 97
General Tire & Rubber Co. 176
Goodyear Tire & Rubber Co. 116, 117
Kelly-Springfield Tire Co. 126
Polack Tire & Rubber Co. 112
Stanwood Rubber Co. 315
Syracuse Rubber Co., Inc. 180
Thermoid Rubber Co. 161, 261
United States Rubber Co. 95

Tire Inflators
(See Pumps, Power Tire)

Tire Presses
Excelsior Tool & Machine Co. 310
Wellman-Seaver-Morgan Co. 300

Tire Protectors
Jones-Conover Products 83

Tire Repair Articles
American Machine Co., Inc. 44
Soper Vulcanizing Mfg. Co. 43

Tools, Machines, Etc.
Continental Auto Parts Co. 44
Holley Tool Mfg. Co. 43
K. P. Products, Inc. 316
Lee, H. A., Tool & Mfg. Co. 43
Marquette Mfg. Co., Inc. 43
Mossberg, Frank, Co. 319
Trexler Co. 43
Wakefield, Clarence E. 45
Wilson, K. R., Co. 46

Top Materials
Du Pont Fabrikoid Co. 315
Pantasote Co. 250

Torque Arms
Hydraulic Pressed Steel Co. 150

Towing Devices
Waite Rhoads Co. 84

Tractors
Dart Truck & Tractor Corp. 332
Graham Brothers 308
Watson Products Corp. 248

Trailers
Arcadia Trailer Corporation 308
Automotive Trailer Corporation 14
Byron Engineering Works 275
Columbia Motor Truck & Trailer Co. ... 265
Detroit Trailer Co., Inc. 260
Fruehauf Trailer Co. 229
Hesse, Wm. G., & Son Mfg. Co. 317
Highway Trailer Co. 244
King Trailer Co. 310
Lee Loader & Body Co. 282
Ohio Motor Vehicle Co. 305
Rogers Brothers Co. 311
Trailmobile Co. 164
Warner Manufacturing Co. 130
Watson Products Corporation 248
Wolverine Truck Trailer Co. 65

Transmissions
Broadway Tool & Machine Co., Inc. 84
Brown-Lipe Gear Co. 197
Cotta Transmission Co. 140
Covert Gear Co., Inc. 115
Detroit Gear & Machine Co. 299
Durston Gear Corporation 148
Fuller & Sons Mfg. Co. 121

Transmission Hangers
S K F Industries, Incorporated 105

Transmission Linings
General Asbestos & Rubber Co. 279

Truck Attachments & Converting Units
Carrier Motor Truck Co. 309
Swedish Crucible Steel Co. 318

Tubing (Steel)
Detroit Seamless Steel Tubes Co. 288
Metal Hose & Tubing Co., Inc. 307
Tite flex Metal Hose Corporation 319

Universal Joints
Baker Gun & Forging Co. 294
Blood Bros. Machine Co. 301
Hartford Automotive Parts Co. 295
Merchant & Evans Co. 290
R-S Manufacturing Co. 314
Slocum, Avram & Slocum Laboratories, Inc. 124
Spicer Mfg. Corporation 158
Thermoid Rubber Co. 161, 261
Universal Machine Co. 298

Upholstery Material
Du Pont Fabrikoid Co. 315

Vacuum Systems
Stewart-Warner Speedometer Corp. 264

Valve Grinders
Corbin, P. & F. Co. 46

Valve Grinding Compounds
S. & P. Mfg. Co. 310

Valve Spring Compressors
Trexler Co. 43

Vulcanizers
Soper Vulcanizing Mfg. Co. 43

Wagons (Dumping)
Watson Products Corporation 248

Warning Signals
Buell Manufacturing Co. 145

Wheels
Automotive Wood Wheel Manufacturers' Asso. 187
Clark Equipment Co. 93
Cornfield Wheel Co., Inc. 154
Dayton Steel Foundry Co. 163
Detroit Pressed Steel Co. 292
Jaxon Steel Products Co. 139
Luverne Auto Co. 308
Martin Cushion Wheel Co. 109
Muncie Wheel Co. 271
Schwarz Wheel Co. 300
Sewell Cushion Wheel Co. 101
Smith Wheel, Inc. 240
Standard Steel Castings Co. 182
West Steel Casting Co. ...Inside Front Cover

Whistles
Buell Manufacturing Co. 145

Winches
Bay City Foundry & Machine Co. 280
Mead-Morrison Mfg. Co. 224

Windings
Apollo Magneto Corp. 274

Wire Wheel Repair Stands
Weaver Mfg. Co. 44

Wrenches
Apollo Magneto Co. 274
Holley Tool Mfg. Co. 43
Mossberg, Frank, Co. 319
Wakefield, Clarence E. 45

HURLBURT

MOTOR TRUCKS



Designed to meet the exacting requirements of the New York Metropolitan district. The Hurlburt is now also making good in other cities.

America's quality heavy-duty truck. Endorsed by some of the country's best known firms, and the Federal Government.

Made of the finest materials only. Nickel steel frame. Silicon Manganese springs 60" long. Extra heavy transmission, extra heavy rear axle spindles and bearings. Hurlburt Hindley worm gear a special feature.

Substantially the same today as when first designed eight years ago, and still years ahead of competition. The first Hurlburt is still doing a full day's work.

Consult Users

Four Models 1½-2, 2½-3, 3½-4, 5-5½ Tons

HURLBURT MOTORS, Inc.

8-10 E. 39th St., New York City

Service Station, 133d St. and 3rd Ave., N. Y. C. **Factory, Harrisburg, Pa.**

HURLBURT

Advertisers' Index

A

A. B. & B. Sheet Metal Works..... 278
Acme Motor Truck Co..... 183
Adams Axle Co..... 306
Aluminum Manufacturers, Inc..... 320
American Bosch Magneto Corp..268, 269
American Business Corporation..... 213
American Commercial Car Co..... 293
American Hammered Piston Ring Co. 9
American Machine Co..... 218
American Malleable Castings Asso.. 246
American Motor Truck Co.....178, 179
American Taximeter Co..... 309
Apollo Magneto Corp..... 274
Arcadia Trailer Corporation..... 308
Archer Iron Works..... 277
Armleder, O., Co.....254, 255
Arrow Grip Manufacturing Co., Inc. 321
Atterbury Motor Car Co..... 91
Auglaize Motor Car Co..... 320
Autocar Co..... 16
Automotive Trailer Corporation.... 14
Automotive Wood Wheel Manufacturers' Association..... 187
Auto Truck Steel Body Co..... 300
Available Truck Co..... 149

B

Babcock, H. H., Co..... 291
Baker Gun & Forging Co..... 294
Baldwin Chain & Mfg. Co..... 210
Bantam Ball Bearing Co..... 309
Bay City Foundry & Machine Co... 280
Bearings Co. of America..... 314
Bearings Service Co.....174, 175
Bessemer Motor Truck Co..... 138
Bethlehem Motors Corporation..... 266
Billings & Spencer Co..... 221
Blood Brothers Machine Co..... 301
Borg & Beck Co..... 313
Bossert Corporation, The..... 6
Bound Brook Oil-less Bearing Co.... 276
Bowen Products Corp..... 279
Bower Roller Bearing Co..... 125
Bowser, S. F., & Co., Inc..... 287
Brown-Lipe-Chapin Co..... 197
Brown-Lipe Gear Co..... 197
Buda Co..... 103
Buell Manufacturing Co..... 145
Byron Engineering Works..... 275

C

Carrier Motor Truck Co..... 309
Challoner Co..... 206
Champion Machine & Forge Co..... 312
Chicago Standard Axle Co..... 320
Childs, O. J., Co..... 195
Chilton Co..... 321
Clark Equipment Co..... 93
Cleveland Worm Gear Co..... 231
Climax Molybdenum Co..... 12
Clydesdale Motor Truck Co..... 141
Columbia Axle Co..... 235
Columbia Motor Truck & Trailer Co. 265
Columbia Wagon Co..... 284
Columbian Steel Tank Co..... 196
Continental Motors Corporation.... 184
Cornfield Wheel Co., Inc..... 154
Cotta Transmission Co..... 140
Covert Gear Co., Inc..... 115
Cramp, Wm., & Sons, S. & E. Bldg. Co..... 297
Cullman Wheel Co..... 316
Curtis Saw Co..... 303

D

Dallas Brass & Copper Co..... 280
Dart Truck & Tractor Corp..... 332
Day-Elder Motors Corporation..... 241
Dayton Steel Foundry Co..... 163
Defiance Motor Truck Co..... 4
Delaware Hard Fibre Co..... 299
Denby Motor Truck Co..... 313
Dependable Truck & Tractor Co.... 290
Detlaff, A. J., Co..... 128
Detroit Gear & Machine Co..... 299
Detroit Pressed Steel Co..... 292
Detroit Seamless Steel Tubes Co.... 288
Detroit Trailer Co., Inc..... 260
Diamond T Motor Car Co..... 202
Dietz, R. E., Co..... 243
Doehler Die-Casting Co..... 305
Duplex Truck Co..... 201
Dupont Fabrikoid Co..... 315
Durston Gear Corporation..... 148

E

East Iron & Machine Co..... 298
Eclipse Machine Co..... 312
Eisemann Magneto Corporation.258, 259
Electric Storage Battery Co..... 245
Ericsson Mfg. Co..... 312
Excelsior Tool & Machine Co..... 310

F

Fafnir Bearing Co..... 304
Fahrig Metal Co..... 312
Federal Bearings Co., Inc..... 302
Federal Motor Truck Co..... 156
Field Mfg. Co..... 315
Firestone Tire & Rubber Co..... 85
Fisk Rubber Co..... 97
Fitzgerald Mfg. Co..... 318
FitzJohn-Erwin Manufacturing Co.. 318
Foley Traction Rim Co., Inc..... 288
Ford Chain Block Co..... 301
Forest City Machine & Forge Co.... 212
Forschler Motor Truck Mfg. Co.... 193
Foster, Merriam & Co..... 208
Fruehauf Trailer Co..... 229
Fuller & Sons Mfg. Co..... 121

G

G. & O. Manufacturing Co..... 15
Garford..... 107
Gary Motor Truck Co..... 299
General Asbestos & Rubber Co..... 279
General Motors Truck Co..... 142
General Tire & Rubber Co..... 176
Geuder, Paeschke & Frey Co..... 10
Gill Mfg. Co..... 190
Golden, Belknap & Swartz Co..... 317
Goodyear Tire & Rubber Co.116, 117, 118
Graham Brothers..... 308
Gramm-Bernstein Motor Truck Co.. 227
Grant Motor Car Corporation..... 303

H

Hamilton Motors Co..... 111
Hartford Automotive Parts Co..... 295
Hart Roller Bearing Co..... 289
Harvey Spring & Forging Co..... 134
Hawkeye Truck Co..... 191
Hebb Motors Co..... 257
Heil Co..... 316
Hendrickson Truck Crane Co..... 320
Hercules Motor Mfg. Co..... 270
Hero Manufacturing Co..... 8
Herschell-Spillman Motor Co..... 159
Hesse, Wm. G., & Son Mfg. Co..... 317
Hide, Leather & Belting Co..... 205
Highland Body Mfg. Co..... 286
Highway Trailer Co..... 244
Hooven Radiator Co..... 304
Hoover Steel Ball Co..... 99
Horizontal Hydraulic Hoist Co..... 303
Hudson Motor Specialties Co..... 319
Huffman Brothers Motor Co..... 186
Hurlburt Motors, Inc..... 327
Hyatt Roller Bearing Co..... 237
Hydraulic Hoist Mfg. Co..... 292
Hydraulic Pressed Steel Co..... 150

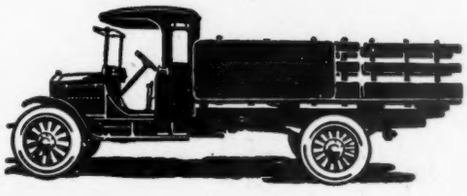
I

Independent Motor Truck Co., Inc.. 114
International Harvester Co. of America, Inc..... 222
International Motor Co..... 209
Iron City Products Co..... 203
Iron City Spring Co..... 302
Irving Iron Works Co..... 286

J

Jackson Motors Corporation..... 317
Janney, Steinmetz & Co..... 311
Jaxon Steel Products Co..... 139
Jenkins Vulcan Spring Co..... 297
Johns-Manville, H. W., Co.....272, 273

Rainier Sales "Come Through Clean"



Rainier

WORM DRIVE Delivery Trucks

¾ TON—$1750
1 TON—$1875
1½ TON—$1975
2 TON—$2400

A PIECE of high-class machinery—dependable and trustworthy—that is what the dealer delivers who represents the Rainier truck.

Rainiers keep promises without any trailer of tinkering and trouble. And so the success of Rainier distributors becomes a simple problem of energetic selling—never crippled by a history of expensive breakdowns or defects.

The Rainier distributor can estimate the number of cars he will sell and the gross profit he will realize. He can be certain that the net profits will be uniform—for the kind of units and engineering that are behind the Rainier is the finest warrant of a truck that will hold the road—and earn profit for both the man who buys and the man who sells the Rainier!

Rainier Sales Come Through Clean!

Can You Swing the Rainier Agency?

Real selling ability is the first consideration—preferred even to a large initial order. The territory offered is exceptional—the contract terms most liberal. Write for details.

Rainier Motor Corporation
SALES DEPARTMENT
225 West 58th Street, New York
Factory—Flushing, Long Island, New York

SPECIFICATIONS

MOTOR—Continental Red Seal in all models

CLUTCH—Brown-Lipe multiple disc

SPRING CONSTRUCTION—Patented double safety shackle on front end of rear springs

TRANSMISSION — Brown-Lipe

REAR AXLE—Timken and Sheldon worm and gear

CARBURETOR—Zenith, with Stewart Vacuum system and Monarch Governor

IGNITION—Simms or Bosch Magneto

WHEELBASE—¾ Ton 125"; 1½ Ton 133"; 2 Ton 147"

LOADING SPACE—¾ Ton 90"; 1½ Ton 9' to 10'; 2 Ton 11' to 12'

Advertisers' Index—Continued

K

K. P. Products Co., Inc..... 316
Kalamazoo Motors Corporation..... 315
Kellogg Mfg. Co..... 331
Kelly-Springfield Tire Co..... 126
Kentucky Wagon Mfg. Co., Inc..... 230
Keystone Motor Truck Corporation. 256
Kilbourne & Jacobs Mfg. Co....131, 132
King Trailer Co..... 310
Kissel Motor Car Co..... 135
Koehler, H. J., Motors Corporation.. 185

L

Laminated Shim Co..... 297
Larrabee-Deyo Motor Truck Co., Inc..... 294
Lauraine Magneto Co., Inc..... 253
Lavine Gear Co..... 11
Lee Loader & Body Co..... 282
Le Roi Co..... 325
Lewis Hall Iron Works..... 160
Light Mfg. & Fdy. Co..... 306
Lockwood-Ash Motor Co..... 217
Long Manufacturing Co..... 157
Luedinghaus Wagon Co..... 281
Luverne Auto Co..... 308
Lycoming Foundry & Machine Co... 192

M

McCord Manufacturing Co., Inc.... 200
Maccar Truck Co..... 165
Machine Products Co..... 302
Madison-Kipp Corporation..... 232
Mansfield Steel Corporation..... 307
Maremont Mfg. Co..... 311
Marlin-Rockwell Corporation..... 181
Martin Cushion Wheel Co..... 109
Martin-Parry Corporation.....123, 167
Master Trucks, Inc..... 169
Mather Spring Co..... 234
Maxwell..... 151
Mead-Morrison Manufacturing Co.. 224
Merchant & Evans Co..... 290
Metal Hose & Tubing Co., Inc..... 307
Metropolitan Body Co., Inc..... 299
Michigan Lubricator Co..... 236
Midwest Engine Co..... 168
Minneapolis Steel & Machinery Co.. 127
Modern Electric & Machine Co..... 319
Modine Manufacturing Co..... 285
Monarch Governor Co..... 194
Mossberg, Frank, Co..... 319
Motors Metal Manufacturing Co.... 293
Motor Truck Radiator & Mfg. Co... 283
Multibestos Co.....170, 171
Muncie Wheel Co..... 271
Muskegon Motor Specialties Co..... 313
Mutual Truck Co..... 300

N

Napoleon Motors Co..... 144
Nash Motors Co..... 263
National Guarantee Credit Corporation..... 129
Nelson Motor Truck Co..... 119
New Departure Manufacturing Co.. 283
New Process Gear Corporation..... 226
Niehoff, Paul G., & Co., Inc..... 301
Noble Motor Corporation..... 296
Norma Co. of America..... 277

O

Oakes Co..... 133
Oakley Chemical Co..... 289
Obenberger, John, Forge Co..... 172
Ohio Motor Vehicle Co..... 305
Oneida Motor Truck Co..... 136
Oshkosh Motor Truck Mfg. Co..... 298

P

Packard Electric Co..... 281
Paige-Detroit Motor Car Co..... 120
Pantasote Co..... 250
Parish & Bingham Corporation..... 249
Park Drop Forge Co..... 291
Parker Appliance Co., Inc..... 309
Parker Motor Truck Co..... 162
Petry, N. A., Co., Inc..... 314
Pierce-Arrow Motor Car Co..... 152
Pierce Governor Co..... 143
Piston Ring Co..... 204
Polack Tyre & Rubber Co..... 112
Portland Cement Association..... 147
Powell Muffler & Timer Co..... 316
Powrlok Co..... 239
Precision Castings Co., Inc..... 308
Pressure Proof Piston Ring Co..... 298

R

R. S. Manufacturing Co..... 314
Rainier Motor Corporation..... 329
Randall Steel Dumping Bodies Co... 314
Republic Motor Truck Co., Inc. Front Cover
Rogers Brothers Co..... 311
Rome-Turney Radiator Co..... 287
Ross Gear & Tool Co..... 87
Rowe Motor Mfg. Co..... 238
Russel Motor Axle Co. Inside Back Cover
Russell Manufacturing Co..... 228

S

S K F Industries, Incorporated..... 105
S. & P. Manufacturing Co..... 310
Sanford Motor Truck Co..... 306
Savage Arms Corporation..... 216
Schacht, G. A., Motor Truck Co.... 220
Schwarz Wheel Co..... 300
Selden Truck Corporation..... 13
Service Motor Truck Co.....146
Sewell Cushion Wheel Co..... 101
Sheldon Axle & Spring Co..... 262
Signal Motor Truck Co..... 247
Simplex Manufacturing Co..... 295
Sinclair Refining Co.....214, 215
Sivyer Steel Casting Co..... 89
Slocum, Avram & Slocum Laboratories, Inc..... 124
Smith, A. O., Corporation..... 284
Smith Wheel, Inc..... 240
Spicer Mfg. Corporation..... 158
Splitdorf Electrical Co..... 113
Spring Perch Co..... 7
Standard Motor Truck Co..... 251
Standard Parts Co..... 155
Standard Steel Castings Co..... 182
Stanwood Rubber Co., Inc..... 315
Staybestos Manufacturing Co..... 311
Stewart Motor Corporation..Back Cover
Stewart-Warner Speedometer Corp.. 264
Stoughton Wagon Co..... 285
Stromberg Motor Devices Co..... 166
Sullivan Motor Truck Corporation.. 301
Swedish Crucible Steel Co..... 318
Syracuse Rubber Co., Inc..... 180

T

Teagle Co..... 306
Thermoid Rubber Co.....161, 261
Thomson Auto Specialties Co..... 137
Tiffin Wagon Co..... 225
Timken-Detroit Axle Co..... 233
Timken Roller Bearing Co..... 211
Titan Truck Co..... 304
Titeflex Metal Hose Corporation... 319
Torbensen Axle Co..... 153
Tower Motor Truck Co..... 310
Traffic Motor Truck Corporation.... 173
Trageser, John, Steam Copper Works 305
Trailmobile Co..... 164
Transportation Finance Co., Inc..... 307
Transport Truck Co.....188, 189
Traylor Engineering & Mfg. Co..... 252

U

Union Motor Truck Co..... 317
Union Switch & Signal Co..... 278
United States Motor Truck Co., Inc. 198, 199
United States Rubber Co..... 95
Universal Machine Co..... 298

V

Van Briggle Motor Device Co..... 267
Veeder Mfg. Co..... 282

W

Walker Mfg. Co..... 219
Ward LaFrance Truck Corp..... 307
Warner Gear Co..... 223
Warner Manufacturing Co..... 130
Watson Products Corporation..... 248
Waukesha Motor Co..... 323
Weidely Motors Co..... 303
Wellman-Seaver-Morgan Co..... 300
Western Drop Forge Co..... 242
Westinghouse Electric & Manufacturing Co..... 207
West Steel Casting Co. Inside Front Cover
Williams, J. H., & Co..... 296
Wilson, J. C., Co..... 304
Winther Motor Truck Co..... 302
Wisconsin Motor Mfg. Co..... 313
Wisconsin Parts Co..... 122
Wood Hydraulic Hoist & Body Co.. 318
Wyman-Gordon Co..... 5

X

"X" Laboratories..... 305

Z

Zenith Carburetor Co..... 177





The Tale That the Truck Shows Tell

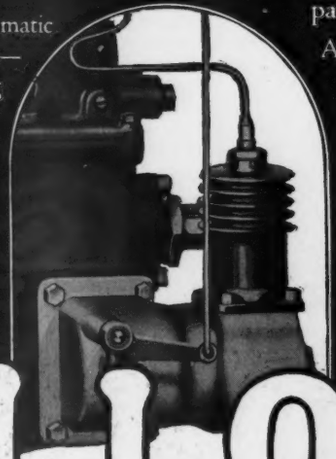
ALL of you manufacturers and dealers who visited the Truck Shows must have noted the big percentage of pneumatics—on the largest trucks and the smallest.

This proves clearly that the pneumatic tire has made good—found its place—in heavy-duty service. For Kellogg had removed the only obstacle to its complete success, with a new heavy duty engine-driven tire pump. Here again the Truck Shows furnished the evidence. **With two exceptions, every pneumatic-tired truck that carried an engine driven tire pump was equipped with a Kellogg.**

They're all coming to it. Even those trucks that have no pump equipment have openings in the transmission to fit the Kellogg. They're preparing.

Are you preparing, dealers? Here is a trade waiting, growing—**wide open.** Get set to enter a money-making field—a field that is rapidly expanding.

Write today for discounts and full details.



KELLOGG MFG. CO. ROCHESTER NEW YORK

KELLOGG

SINE DR

Tire Pump

Consider This Ideal Truck and Tractor Line

The economy of Dart Trucks is recognized when their value is measured in accurate terms of upkeep and repair costs.

Keen executives, who are accustomed to judge by results and on the basis of facts, cannot gainsay the remarkable service records which Dart dealers have at their disposal.

Dart

The continued growth of Dart sales is positive evidence that each Dart Truck lives up to the claims made for it, and in most cases even exceeds them.

Truck buyers, who desire quality construction, are impressed with the general excellence of Dart construction.

Here is a truck and tractor line combined, including six models that give the dealer one hundred per cent sales opportunities. With Dart Trucks and Tractors it is never necessary to lose a sale because there is no model in your line that meets a customer's needs.

1, 1½, 2½, 3½ ton trucks and the Dart "Blue J" Tractor for every haulage or power-farming need.

Let us tell you more about our Sales Proposition.

DART TRUCK & TRACTOR CORP., WATERLOO, IOWA



THE COMMERCIAL CAR JOURNAL

Entered as second-class matter at the Post Office at Philadelphia, Pa., under the act of March 3, 1879

Vol. XIX PHILADELPHIA, APRIL 15, 1920 No. 2

Published the 15th of each month by the

CHILTON COMPANY

Market and 49th Streets Philadelphia, U.S.A.

JAMES ARTMAN, President C. A. MUSSELMAN, Treas. & Gen'l Mgr.
GEO. H. BUZBY, Vice President A. H. VAUX, Secretary

ADVERTISING DEPARTMENT

C. MONROE SMITH, Eastern Manager
GEORGE H. DUCK, Western Manager
S. S. CHISHOLM, Chicago L. E. McCONNELL, Jr., New York
J. C. WEED, Detroit A. W. BROWNELL, New York
E. W. CORMAN, Cleveland
GEO. D. ROBERTS, Advertising Director, Chilton Service

EDITORIAL DEPARTMENT

JAMES ARTMAN, Editor in Chief E. S. FOLJAMBE, Directing Editor
ALBERT G. METZ, Managing Editor
MARTIN J. KOITZSCH, Associate Editor

EDITORIAL REPRESENTATIVES

C. P. SHATTUCK, Eastern A. V. COMINGS, Western
CHESTER S. RICKER, Technical HARRY R. BRATE, Field Editor

TABLE OF CONTENTS

Advertisers' Index	342
Buyers' Index of Reading and Advertising Pages	336
Coming Events	41
Commercial Car Specifications	71
Editorials	39
Engine Specifications	118
Equipment and Appliances	83
New Commercial Cars	50
News of the Trade (Including Personals, New Agencies, Factory Items, etc.)	106
Pneumatic Tire Prices	82
Replacement Table	67
Service and Repair Departments	61
Steel and Rubber Markets	104

SPECIAL ARTICLES

What Kind of a Business Policy Have You?	17
A Good Profit Awaits the Dealer Who Merchandises Standard Truck Bodies	21
Chassis Dimensions for Body Builders	34b
Rhode Island to Construct New Roads	44
Illinois Motor Truck Dealers Take Prominent Part in New State Association	45
Transportation Committee of Federal Highways Council Meeting	49
Magnificient Display of Trucks at the Boston Show.	56
The Right Kind of a Body Helps Sell Trucks to Farmers	60
Efficient Service Station Big Factor in Building Up Truck Sales	90
Senator Townsend Explains Federal Highways Bill.	96
What Are You Dealers Going to Do About It?	98
Replacing Street Cars With Motor Truck Buses	100

SUBSCRIPTION RATES

United States and Possessions	$1.00
Canada	2.00
Foreign	3.00

Make Checks, Money Orders, etc., payable to Chilton Company

Change of Address—Subscribers desiring their address changed should give the old as well as the new

The Commercial Car Journal is a member of the Audit Bureau of Circulations, the Recognized Authority on Circulation Audits



"NORMA"
PRECISION
BALL BEARINGS
(PATENTED)

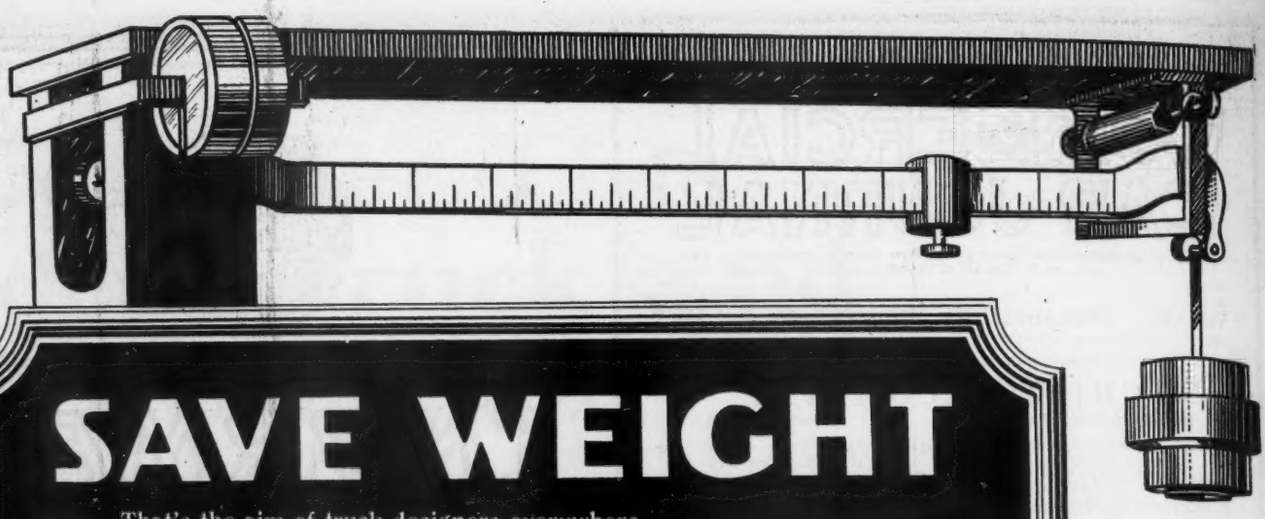
"Silence is golden" might have been written about "NORMA" Bearings—for their silent-running qualities are an evidence of that precision of manufacture which miminizes friction and adds to the useful life of the high-grade magnetos and lighting generators in which they are the standards.

See That Your
Electrical Apparatus
is "NORMA" Equipped

THE NORMA COMPANY
OF AMERICA
Anable Avenue
Long Island City
New York



Ball, Roller, Thrust and Combination Bearings



SAVE WEIGHT

That's the aim of truck designers everywhere.

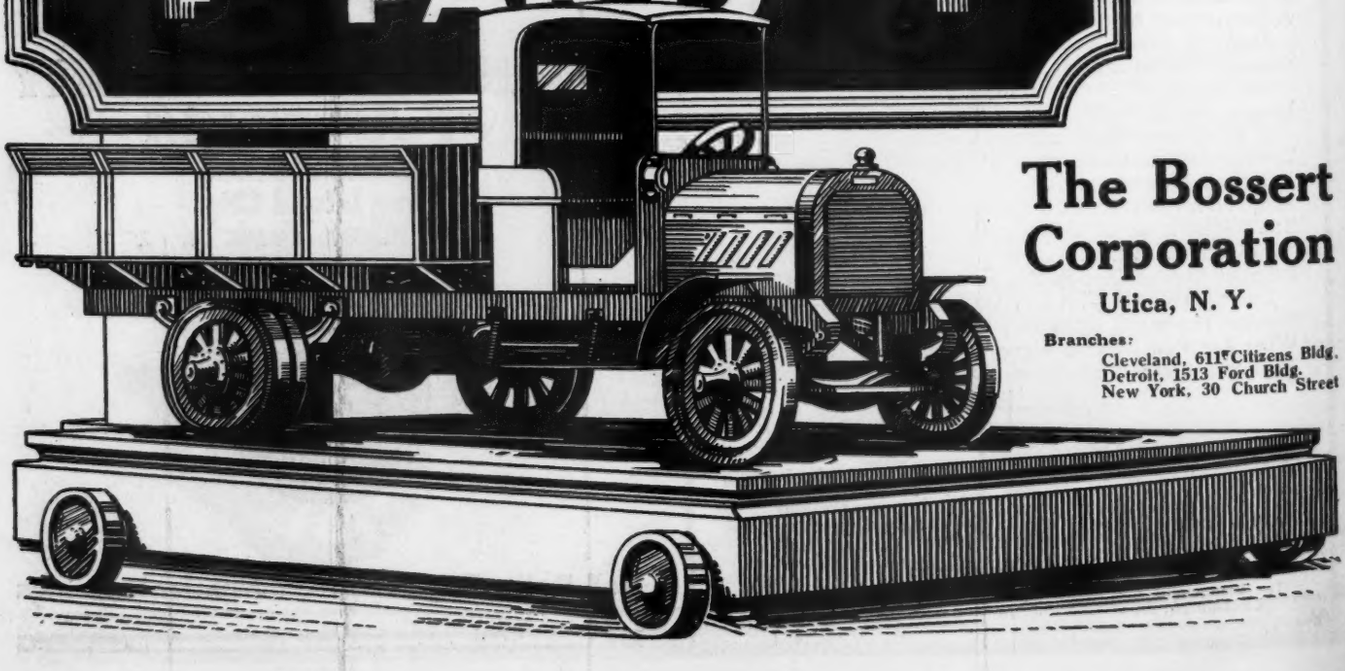
But *save weight without sacrificing strength.*

Bossert Pressed Steel Parts, over 200 in number, enable you to do this. Made of the finest grade of steel with finer knit grain, and closer adherence of molecules, it is possible to cut bulk and size without yielding the least stamina and strength.

In fact, the *lighter-weighing Bossert Parts,* pressed in closer dimensions are without defects that scrap many larger parts and withstand the terrific jars of truck operation without crystallizing or cracking. This cannot be said of bulky drop forgings or those hammered from billets.

BUILD YOUR TRUCK THE BOSSERT WAY

BOSSERT PRESSED STEEL PARTS



The Bossert Corporation

Utica, N. Y.

Branches:
Cleveland, 611 Citizens Bldg.
Detroit, 1513 Ford Bldg.
New York, 30 Church Street